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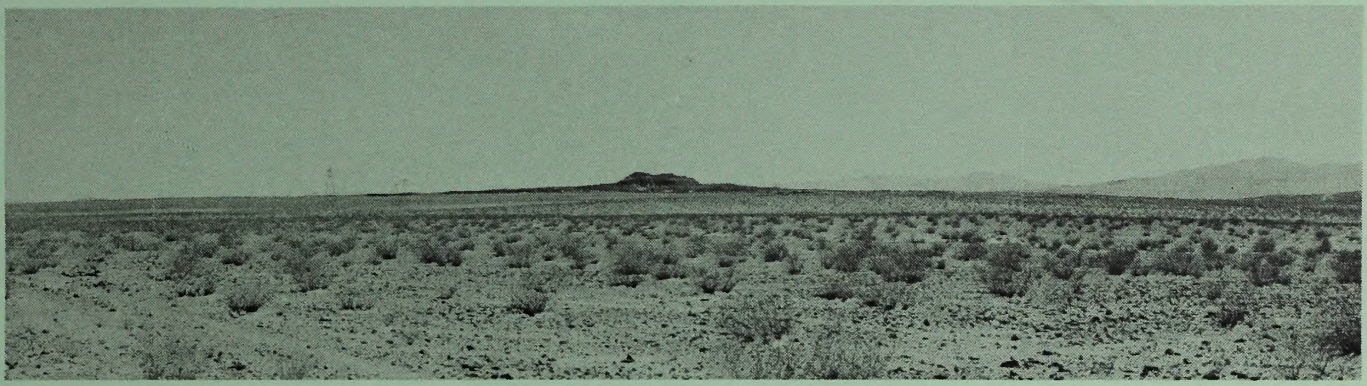
Final
Environmental Impact Statement / Environmental Impact Report

FORT CADY MINERALS CORPORATION SOLUTION MINING PROJECT



SCH 91012074

Prepared For

U.S. Department of the Interior
Bureau of Land Management
and
County of San Bernardino

d By

AMES & MOORE

DECEMBER 1993

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COVER SHEET

FINAL ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT
FORT CADY MINERALS CORPORATION
SOLUTION MINING PROJECT
SAN BERNARDINO COUNTY, CALIFORNIA

DESIGNATION: Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

LEAD AGENCIES:

U.S. Department of the Interior
Bureau of Land Management
Barstow, California

County of San Bernardino Planning Department
San Bernardino, California

COMMENTS

Notice of availability of this Final EIS/EIR was issued in the Federal Register on December 23, 1993, and comments on it should be received within 30 days of the issuance date. Comments should be submitted to the Bureau of Land Management (BLM) at the address given below. Comments must be postmarked no later than January 31, 1994 to be considered by the Bureau of Land Management in their decisions on this proposed project. For further information, contact the BLM or the County at:

Bureau of Land Management
150 Coolwater Lane
Barstow, CA 92311-3221
(619) 256-3591
Attention: Ms. Edy Seehafer

County of San Bernardino, Planning Department
385 N. Arrowhead Ave., 3rd Floor
San Bernardino, CA 92415-0182
(714) 387-4099
Attention: Mr. Randy Scott

PROPOSED ACTION: Construction and operation of the Fort Cady Minerals Corporation in-situ boric acid production mine and the issuance of associated right-of-way grants and mineral material sales permits.

ABSTRACT:

In May, 1990, the BLM published its Notice of Intent (NOI) to prepare an EIS and in January, 1991, the County of San Bernardino issued a Notice of Preparation (NOP) of an EIR for the Fort Cady Project. In accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the BLM and County are preparing this joint EIS/EIR.

The proposed action consists of the construction and operation of a boric acid production mining and processing facility with the capability of producing approximately 90,000 tons of boric acid per year. The project will include a 273-acre ore body well field, a 10-acre processing facility, a 16-acre gypsum deposition area, and 43.5 acres of ancillary services, including a process water supply well network, a railroad spur, a natural gas pipeline, access roads, and electric lines and facilities. The entire project site will encompass approximately 345 acres. The project will employ in-situ solution mining, a process which involves the injection of a weak acid solution into the ore body to extract the boric acid. Processing of the mineral will take place on-site. The final product and the gypsum, a by-product, will be sold to various markets.

Three alternative site locations and a no project alternative were considered. The following issues were identified through the scoping process and are addressed in the Final EIS/EIR and the Draft EIS/EIR documents: geology, hydrology and water quality, erosion potential, climate and air quality, noise, biological resources, land use and recreation, visual resources, transportation, cultural resources, paleontological resources, and socioeconomics. With the implementation of the mitigation measures

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identified in the environmental analysis, most impacts would be reduced to a "not significant" level. However, impacts on hydrologic resources (i.e., resulting from the consumptive use of groundwater) and potential land use conflicts with the proposed Area of Critical Environmental Concern may remain significant even with mitigation.

FORT CADY MINERALS CORPORATION
SOLUTION MINING PROJECT

FINAL EIS/EIR

This document has been approved for public review.

Henri R Bisson — 12/13/93

Henri Bisson
District Manager
Bureau of Land Management

Date

Valery Pilmer — 12/10/93

Valery Pilmer
Director
Planning Department
County of San Bernardino

Date

Final
Environmental Impact Statement/ Environmental Impact Report

FORT CADY MINERALS CORPORATION SOLUTION MINING PROJECT

Prepared For

U.S. Department of the Interior
Bureau of Land Management
and
County of San Bernardino

Prepared By

DAMES & MOORE

DECEMBER 1993

Table of Contents

Part I, Summary

Part II, Additions/Changes to DEIS/EIR

Part III, Scoping and Public Comments and Response

PLANNING DEPARTMENT

385 North Arrowhead Avenue • San Bernardino, CA 92415-0180 • (714) 387-4091
Fax No. • (714) 387-3223

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL MANAGEMENT GROU

SHARON W. HIGHTOWER
Director of Planning

December 10,1993

INTERESTED ORGANIZATIONS AND INDIVIDUALS

RE: NOTICE OF AVAILABILITY FOR THE FINAL EIR /EIS ON THE FT. CADY MINERALS SOLUTION MINING PROJECT

Dear Interested Party:

The Final Environmental Impact Report/Environmental Impact Statement (FEIR/FEIS) for the proposed Ft. Cady Minerals Solution Mining Project has been completed and is available for public review. The proposed Ft. Cady Minerals Solution Mining Project is an in-situ boric acid mining facility on 343 acres located approximately 2.5 miles south of Interstate 40, approximately 17 miles east of the community of Newberry Springs.

The Final EIR/EIR is an extension of the Draft EIR/EIS that was previously distributed for public review and comment. The Final document plus the Draft document and associated appendices and attachments constitute the complete EIR/EIS for the project.

The EIR/EIS will be used, together with other economic, social and technical information, by the County of San Bernardino and the Bureau of Land Management independently in reaching decisions regarding the requested approvals for the project. The County Planning Commission will make a decision on the project at a public hearing which has not been scheduled at this time.

The Bureau of Land Management can prepare a Record of Decision concerning the project no sooner February 1, 1994, in compliance with National Environmental Policy Act procedures. Comments on the Final EIR/EIS and the federal actions associated with this project should be made in writing to the Bureau of Land Management at the address shown below.

Further information regarding the dates and times of these activities may be obtained by contacting:

U.S.D.I. Bureau of Land Management
Barstow Resource Area Office
150 Coolwater Lane
Barstow, CA 92311
Attn: Edy Seehafer
Phone No: (619) 256-3592

County of San Bernardino
Planning Department
385 N. Arrowhead Ave.
Sna Bernardino, CA 92415-0182
Attn: Ray Johnson
Phone No: (909) 387-4105

Sincerely,

Raymond W. John

Raymond W. Johnson, AICP
Senior Associate Planner
Environmental Team

HARRY M. MAYS
County Administrative Officer

ALBERT R. REID
Assistant Administrative Officer
Environmental Management Group

Board of Supervisors
MARSHA TUROCI . . . . First District
JON D. MIKELS . . . . Second District
BARBARA CRAM RIORDAN . . . . Third District
LARRY WALKER . . . . Fourth District
ROBERT L. HAMMOCK . . . . . . Fifth District

MITIGATION MONITORING AND COMPLIANCE PROGRAM

This mitigation monitoring and compliance program has been prepared for use in implementing the conditions of approval for:

Fort Cady Minerals Corporation Solution Mining Project

The program has been prepared in compliance with State law and the Final Environmental Impact Statement/Environmental Impact Report prepared for the project by San Bernardino County and the Bureau of Land Management.

The California Environmental Quality Act (Public Resource Code Section 21081.6) requires adoption of a reporting or monitoring program for those measures placed on a project to mitigate or avoid adverse effects on the environment. The law states that the reporting or monitoring program shall be designed to ensure compliance during project implementation.

The monitoring program contains the following elements:

1) The mitigation measures are recorded with the action and procedure necessary to ensure compliance. In some instances, one action may be used to verify implementation of several mitigation measures.

2) A procedure for compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when, and to whom and when compliance will be reported.

3) The program contains a separate Mitigation Monitoring and Compliance Record for each action. On each of these record sheets, the pertinent actions and dates will be logged, and copies of permits, correspondence or other relevant data will be attached. Copies of the records will be submitted to the Planning Department.

4) The program has been designed to be flexible. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendation by those responsible for the program. As changes are made, new monitoring compliance procedures and records will be developed and incorporated into the program.

MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

1. Disturbed areas shall be reclaimed.

Implementation and verification:

1) To be verified by the San Bernardino County Planning Department.

Compliance Record:

When Required:

1) Within six months of completion of construction and within 18 months of commencement of closure operations.

Verified:

By: ______________________ Date: ______________________

By: ______________________ Date: ______________________

Corrective action: (attach copies of all correspondence)

____ Date: __________
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MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

2. No additional substantial mitigation is possible. However, the following measures shall be implemented in order to provide additional assurance that adjacent aquifers are not affected by migration of mining process solutions:
    a. Additional monitoring of piezometric levels within the mining area and vicinity shall be carried out and the hydraulic gradient in the ore zone area would be evaluated.
    b. Following completion of mining activities, and as part of closure, extraction wells shall be pumped to remove formation fluids until low-pH fluids have been removed and fluids of normal ypH are produced.
    c. Recycled water shall be used to reduce total water consumption during operating activities.

Implementation and verification:

1) The applicant shall submit plans for the implementation of the above measure to the Regional Water Quality Control Board, for review and approval. Copies of the approved plans shall be submitted to the BLM, Barstow Resource Office, and the San Bernardino County Planning Department, Environmental Team. Compliance with the approved plans shall be monitored by the RWQCB or as specified in the approved plans. Copies of all correction notices and correspondence relating to corrective actions shall be sent to the BLM and San Bernardino County Planning Department.

2) RWQCB shall verify that the applicant is operating in compliance with the approved plans.

Compliance Record:

When Required:

1) Prior to water pumping activities.

2) Continuing during operations.

Submitted:

TO: ______________________ Date:______________________

MITIGATION MONITORING AND COMPLIANCE PROGRAM

Corrective action: (attach copies of all correspondence)

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MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

49. 345 acres of off-site desert tortoise habitat lands shall be transferred to the BLM by the proponent to compensate for unmitigated desert tortoise impacts.

Implementation and verification:

1) A copy of the acceptance letter from BLM shall be submitted to the San Bernardino County Planning Department.

Compliance Record:

When Required:

1) Prior to land disturbance.

Verified:

By: ____________________ Date:____________________

MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

3. Construction shall be curtailed during high winds (i.e., 10m/sec).
4. Exposed, disturbed surfaces shall be watered and/or revegetated as soon as practical to prevent wind-blown dust.
5. Vehicular dust generation on access roads shall be minimized by applying water or approved dust pallatives to all unpaved roads.
6. A speed limit of 15 mph shall be posted and enforced on all unpaved roads.
7. The contractor shall establish physical barriers to define the construction site and limit unnecessary disturbance beyond the actual construction zone.
8. Construction equipment shall be maintained as per manufacturer's specifications.
9. The operator shall implement an inspection and maintenance program to reduce fugitive emissions from organic solvent handling equipment (i.e., valves, flanges, and pumps).
10. The operator shall implement a ridesharing program to reduce commuter vehicle trips.
11. Optimal combustion conditions shall be maintained on driers and the cogeneration facility in order to reduce emissions of air pollutants.
12. The baghouse dust collection system, used for PM_{10} removal, shall be inspected, cleaned, and maintained regularly to promote maximum removal efficiency approaching system design levels.
13. The acid absorption system shall be inspected, cleaned, and maintained regularly to promote maximum removal efficiency approaching system design levels.
14. Vehicular dust generation on access roads shall be minimized by applying water or approved dust pallatives on unpaved roads.
15. After the project is under operation, FCMC shall evaluate the feasibility of paving the main access road.

Implementation and verification:

1) The applicant shall submit plans for the implementation of the above measures to the Mojave Desert Air Quality Management District, MDAQMD, for review and approval. Copies of the approved plans shall be submitted to the BLM, Barstow Resource Office, and the San Bernardino County Planning Department, Environmental Team. Compliance with the approved plans shall be monitored by the MDAQMD or as specified in the approved plans. Copies of all correction notices and correspondence relating to corrective actions shall be sent to the BLM and San Bernardino County Planning Department.

2) MDAQMD shall verify that the applicant is operating in compliance with the approved plans.

MITIGATION MONITORING AND COMPLIANCE PROGRAM

Compliance Record:

When Required:

1) Prior to land disturbance.

2) Continuing during operations.

Submitted:

TO: ______________________ Date: ______________________

Corrective action: (attach copies of all correspondence)

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MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

27. A trash abatement program shall be implemented.
45. A protocol specific to handling of hatchlings shall be developed.
46. Reduction of habitat fragmentation caused by the above-ground pipeline shall be accomplished by periodic elevation or burial of the pipeline, or construction of ramps over the pipeline.
47. Reduction of habitat fragmentation shall be reduced through the installation of culverts or underpasses under the access roads and the railroad at all washes and at 0.5 mile intervals.

Implementation and verification:

1) The applicant shall submit plans to implement the preceding measures to the BLM for their review and approval. A copy of the approved plans shall be submitted to the Planning Department.

2) The Planning Department and BLM shall verify that the applicant is operating in compliance with the approved plans.

Compliance Record:

When Required:

1) Prior to land disturbance.

2) Continuing during operations to be verified on annual mine inspections.

Submitted:

TO: ______________________________ Date:___________________

Inspected:

By:____Date: ____________
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MITIGATION MONITORING AND COMPLIANCE PROGRAM

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Mitigation Measures:

28. Structures that may function as common raven nesting or perching sites shall not be authorized except as specifically stated by the BLM.
34. The sides of the gypsum deposition area shall be gently sloped so as to reduce the possibility of entrapment or drowning.
50. Sensitive areas shall be avoided and above-ground pipelines shall be periodically elevated, buried, or have ramps constructed over them to reduce impacts to wildlife mobility and habitat fragmentation.
51. Although no significant adverse impacts are expected, adverse visual impacts shall be mitigated according to the overall goals of the BLM Visual Resource Management Program. Measures include:
    a. Landform screening shall be incorporated wherever feasible;
    b. Surface disturbances shall be minimized, especially those which highlight lava/soil contrasts;
    c. Structure colors shall blend with predominant background colors;
    d. Night-lighting shall be shielded to minimize off-site glare and visibility;
    e. Implementation of Reclamation Plan measures for vegetation and soil disturbances; and
    f. Graded surfaces shall gradually blend the color, texture, and contour of adjacent sand and lava surfaces.
57. Interceptor and drainage ditches shall be designed with dispersion features that minimize erosion potential.

Implementation and verification:

1) The applicant shall submit construction plans to the BLM and Planning Department for review and approval to ensure inclusion of the preceding conditions.

2) The Building and Safety Department shall verify that the construction is in compliance with the approved plans.

Compliance Record:

When Required:

1) Prior to land disturbance.

2) During construction, to be verified on inspections.

Submitted:

MITIGATION MONITORING AND COMPLIANCE PROGRAM

TO: ______________________ Date: ______________

Approved:

By: ______________________ Planning Date: ______________

By: ______________________ Building & Safety Date: ______________

Corrective action: (attach copies of all correspondence)

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MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

17/ 23. No on-site collection or killing of sensitive plant or wildlife species shall be permitted.

19. The mine operator shall designate a field contact representative (FCR), with authority to halt all mining activities that are in violation of any stipulations, who shall be responsible for overseeing compliance with protective stipulations for the desert tortoise and coordination of compliance with the BLM and USFWS.

21. When maintenance activities occur outside of areas enclosed by desert tortoise-proof fences, work areas shall be surveyed by the authorized biologist prior to the onset of maintenance to determine whether desert tortoises are present.

22. A worker education program shall be implemented.

24. Travel shall be limited to approved roads and off-road use shall be prohibited. If desert tortoise-proof fencing is not constructed along the water pipeline, all project-associated vehicles shall maintain a speed limit of 15 mph on this access road.

25. When outside of areas enclosed by desert tortoise-proof fences, workers shall inspect underneath any parked vehicles immediately prior to moving the vehicles.

30. Hazardous material spills, including spills of oils, coolants, grease, diesel fuel, and gasoline shall be cleaned up immediately and the hazardous materials removed. Maintenance yards and containment areas shall be cleaned at the end of the project.

32. Acid solution resulting from spill areas shall be promptly neutralized and cleaned-up to prevent animals and birds from ingesting the solution.

37. An authorized biologist shall maintain a record of all desert tortoises encountered during mining activities.

39. In general, desert tortoises shall be moved the minimum distance possible to ensure their safety.

40. Only qualified biologists shall handle tortoises, and accepted protocol for marking and displacement of tortoises shall be followed.

41. An authorized biologist shall instruct appropriate mine employees in the proper method of handling desert tortoises in the event of emergencies involving animals during routine operation of the facility; or FCMC shall retain a local, BLM/USFWS-authorized biologist available on short notice.

48. Pets, especially dogs, shall not be permitted on site.

Implementation and verification:

1) The applicant, in conjunction with the FCR and project biologist, shall submit a policy manual and training plan to the BLM and Planning Department to implement the preceding conditions.

2) The FCR shall verify that the applicant is operating in compliance with the approved plans and policies and shall maintain a record of training and implementation measures.

Compliance Record:

When Required:

1) Prior to land disturbance.

2) Continuing during operations to be verified on annual mine inspections.

Submitted:

TO: ______________________ Date: ______________________

Inspected:

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Corrective action: (attach copies of all correspondence)

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MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

16. At the end of the project, disturbed areas, including new access roads, shall be recontoured and reseeded with appropriate mixture of native plant species according to BLM specifications.
18/ 20. At least 30 days prior to construction activities, a survey shall be conducted by qualified biologists to identify sensitive species and record their location.
26. Land disturbance during construction shall be restricted to the smallest area required.
29. Contractor shall be responsible for post-construction clean-up. Following completion of construction, barriers shall be erected to limit traffic to the main access roads.
31. A final inspection shall be conducted to evaluate additional impact to desert tortoise habitat and no later than 90 days after completion of construction activities, the FCR and authorized biologist shall prepare a report for the BLM and CDFG.
33. After site rehabilitation, all desert tortoise-proof fence shall be removed.
35. If feasible, construction shall take place during periods when tortoises are least active.
36. An authorized biologist shall be required on-site during pre-construction and construction activities which could harm desert tortoises.
38. Construction sites shall be surveyed 30 days, 72 hours, and again immediately prior to the commencement of construction activities.
42. All major project facilities should be enclosed within desert tortoise-proof fences.
43. After fence installation, an authorized biologist shall conduct a thorough survey for desert tortoises within all enclosed areas.
44. Desert tortoises moved from within a fenced site shall be marked for future identification.

Implementation and verification:

1) The applicant, in conjunction with the FCR and project biologist, shall comply with the above conditions. Copies of reports shall be submitted to the BLM and Planning Department.

Compliance Record:

When Required:

1) As required in the measure.

Submitted:

TO: ____________________ Date: ____________________
TO: ____________________ Date: ____________________

MITIGATION MONITORING AND COMPLIANCE PROGRAM

Corrective action: (attach copies of all correspondence)

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MITIGATION MONITORING AND COMPLIANCE PROGRAM

Mitigation Measures:

52. If feasible, cultural resources shall be avoided.
53. If previously unidentified cultural resources are encountered, construction activities shall be halted until a qualified archaeologist is consulted regarding the significance of the finds. The BLM shall be notified and concerned Native Americans shall be involved, where appropriate.
54. Worker and visitor education with respect to not disturbing cultural resources shall be implemented.
55. A paleontologist shall spot check construction activities in areas where paleontological resources are most likely to be found.
56. Worker education with respect to the potential for uncovering fossil remains and the legal protection such fossils are afforded shall be implemented.

Implementation and verification:

1) The applicant shall submit a policy manual and employee and visitor training manual to the BLM, County Museum and Planning Department for review and approval.

2) The applicant shall operate according to the approved plans and policies.

Compliance Record:

When Required:

1) Prior to land disturbance.

2) Continuing during operations to be verified by the FCR on annual mine inspections.

Submitted:

TO: ______________________________ Date: ______________________

Approved:

By: ______________________________ Date: ______________________

Inspected:

By: ____________________________________ Date: ______________________
By: ____________________________________ Date: ______________________

MITIGATION MONITORING AND COMPLIANCE PROGRAM

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PART I

SUMMARY

INTRODUCTION

In accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) has been prepared to identify and analyze the potential environmental impacts of the Fort Cady Minerals Corporation in-situ borate mining proposal. This document constitutes the Final EIS/EIR for the project. It is being circulated as a disclosure and response document to comments received on the Draft EIS/EIR. The evaluation and response to public comments is an essential part of the full disclosure environmental review process for both NEPA and CEQA.

The Draft and Final EIS/EIR and associated appendices and attachments, taken together, constitute the complete EIS/EIR for the project. It will be used by the U.S. Department of the Interior, Bureau of Land Management (BLM), the County of San Bernardino, and other agencies to consider the project and its potential environmental impacts prior to the issuance of permits and approvals.

This document is divided into three parts. Part I includes a summary of the proposed action, alternatives, anticipated environmental impacts and required mitigation. Part II includes additions and changes to the Draft EIS/EIR based on public and agency comment and review. Part III includes a summary of the public scoping process, all comments received on the Draft EIS/EIR during the public comment period, transcripts from public meetings, and responses to comments.

PURPOSE OF AND NEED FOR ACTION

The purpose of the proposed action is to establish a commercial "in-situ" mine to recover boric acid for domestic and foreign use. This mine would produce boric acid at a rate of 90,000 tons per year from the extraction of a colemanite ore body located approximately 1,400 feet below the surface.

Boric acid is used in the manufacture of over 150 different industrial products including the following: glass, which is strengthened and able to withstand higher temperatures after the addition of boron; fiberglass, which has been in greater demand in the United States since the energy crisis of the mid-1970's; fire retardants; insecticides; ceramics; detergents (as a replacement for phosphates); and eye wash solutions.

Boric acid is currently produced by three major international companies: U.S. Borax, Inc. and North American Chemical Company, California, and Etibank, Turkey. FCMC, as an additional domestic producer, could potentially lower the dependence of American manufacturers on foreign imports of boric acid (approximately 20 percent of the boron oxide compounds used in the United States are imported). Furthermore, the additional production from the proposed action could facilitate increased export of boric acid to other countries.

The proposed in-situ mining process could also reduce consumer costs for a variety of industrial products (including those mentioned above). Pilot testing has established that the in-situ mining process is commercially viable.

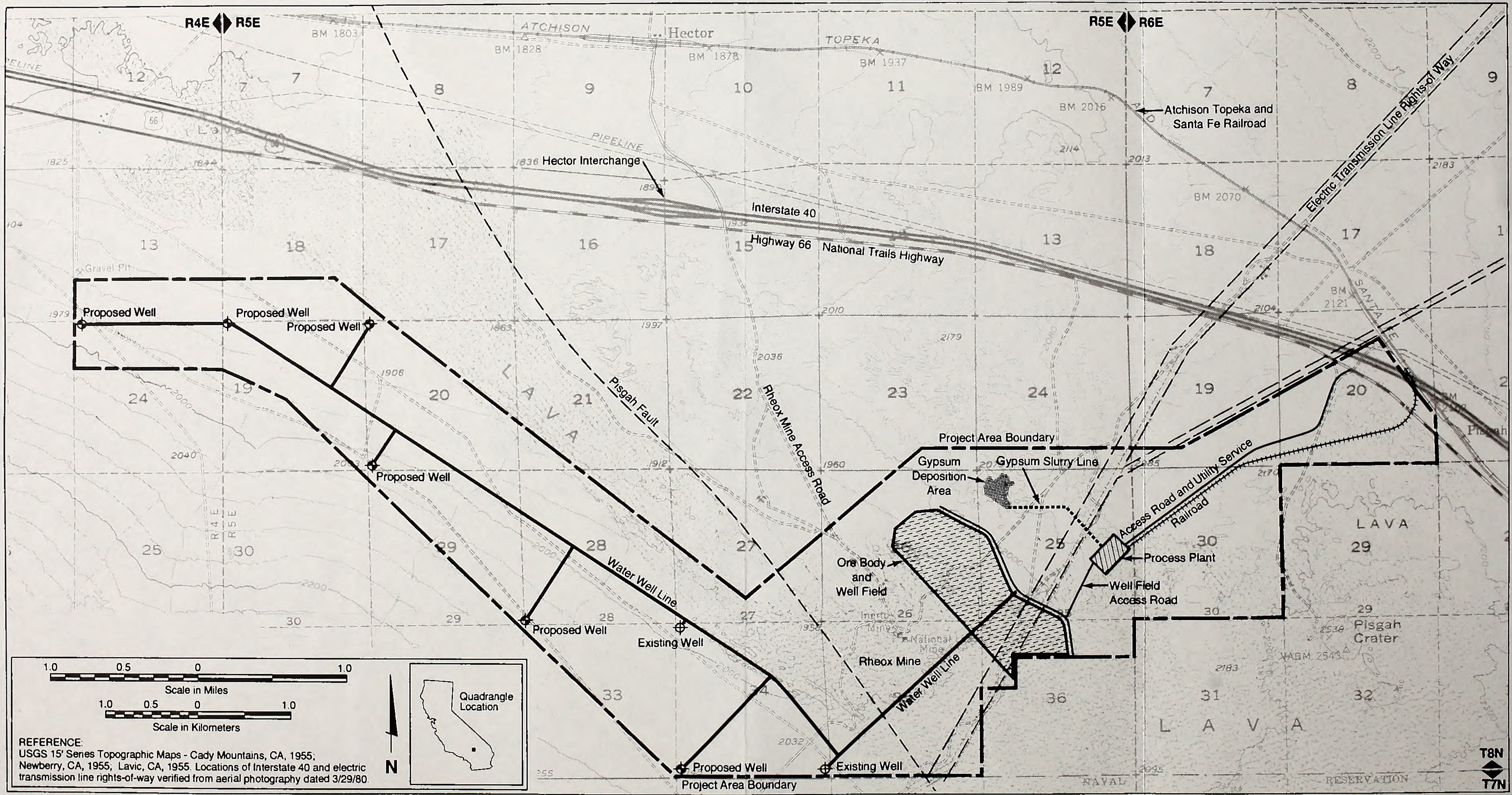
PROPOSED ACTION

The proposed action is on a 343-acre site (Figure 1) and would extract boric acid through the injection and extraction of a weak hydrochloric and/or sulfuric acid solution in the alkaline ore body. The extracted solution would be processed to precipitate boric acid crystals, and the crystals would be packaged for shipment or loaded for bulk delivery. The acid would be removed from the ground through an in-situ mining process which, in simplified terms, involves (1) the pumping of a weak acid solution into the ore body 1,400 feet below the surface; (2) a chemical reaction between the acid and the alkaline elements in the ore body which forms boric acid in the solution; and (3) an extraction of the solution by a reverse-pumping process.

The mining operation would produce gypsum as a by-product, which would potentially be sold to the local cement industry or to producers of drywall or soil conditioners.

In addition to the wells and piping located on the ore body, a variety of other facilities would be constructed as part of the project, including:

- a series of water wells and waterlines used to produce and route process water;
- a process plant (approximately 240,000 square feet) consisting of equipment to extract the boric acid from the injected solution, purify and crystallize the boric acid, regenerate the acids used in the injection/extraction process, load and ship the boric acid crystals, generate electricity (natural gas cogeneration unit) and process/store chemicals and products;
- ancillary facilities, including a natural gas pipeline to serve the cogeneration power facility; and an electrical transmission line to link the plant with outside utility systems;



REFERENCE:
USGS 15' Series Topographic Maps - Cady Mountains, CA, 1955; Newberry, CA, 1955; Lavic, CA, 1955. Locations of Interstate 40 and electric transmission line rights-of-way verified from aerial photography dated 3/29/80.

DAMES & MOORE
21864-001-001

ORIGINAL PROPOSED PROJECT AREA

Fort Cady EIS/EIR
Fort Cady Minerals Corporation
Newberry Springs, California
FIGURE 1

- a deposition pond area to store gypsum;
- a railroad spur to provide bulk shipment capability; and
- a system of access roads to connect site facilities providing access to local road and highway corridors.

The project would employ approximately 80 full-time employees, who would work in alternating shifts 24 hours per day. Based on the size and accessibility of the ore body, the project is expected to be in operation for approximately 130 years.

ALTERNATIVES TO THE PROPOSED ACTION

Project alternatives evaluated in this document include:

- ***No Action Alternative*** — As required by NEPA and CEQA, this alternative reflects the non-use of the site for the project, and provides a basis from which to measure the impacts of the various other alternatives considered.

  Under the No Action Alternative, the adverse impacts identified with the proposed action would not occur. If a right-of-way grant for the project was not issued, claimant rights to pursue a mining operation granted by the General Mining Law of 1872 could continue (as long as it does not cause unnecessary or undue degradation of federal lands) pursuant to §40 CFR 3809.0-6. In addition, the loss of the relatively small beneficial economic and employment impacts associated with the No Action Alternative is not expected to make a substantial difference in the overall regional economy. If the project were not developed, however, the potential would not occur for some reduction in the dependence of American manufacturers on foreign imports of boric acid, and the potential to increase foreign export of boric acid would not exist. Other benefits which would not be realized include the potential reduction of consumer costs for certain industrial products and the opportunity to establish a track record of the in-situ mining process for further use of the technique.

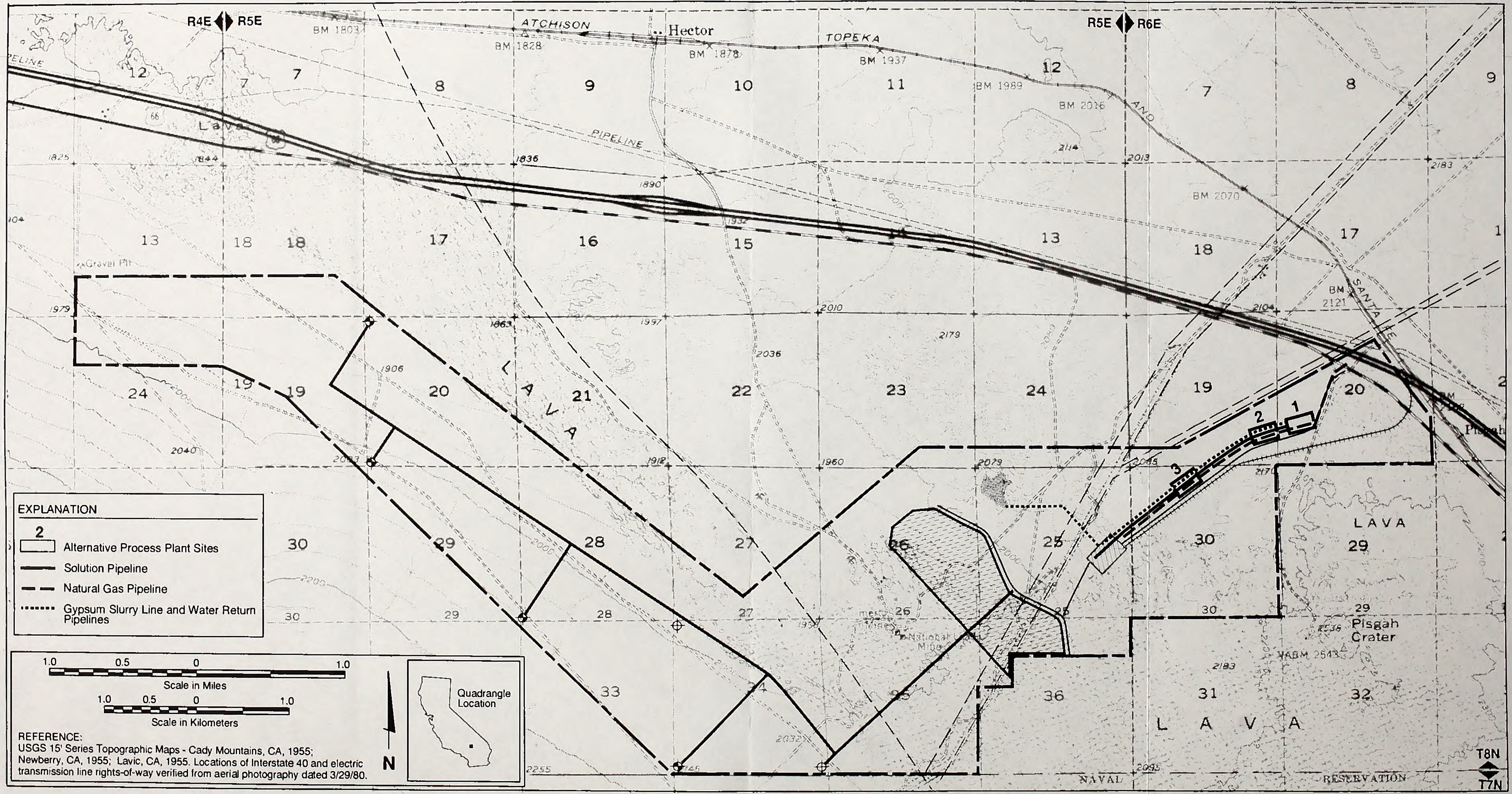
- ***Alternative Process Plant Locations*** — Numerous site constraints, environmental considerations, and functional requirements have focused the major alternatives analysis for the project on the location for the process plant. Several key elements of the project, including available groundwater, the ore body, and the gypsum deposition area (based on the U.S. Fish and Wildlife Service Biological opinion), cannot be moved within the proposed project site. Ancillary facilities and roadway/railway access alternatives to the site

are well-defined due to existing infrastructure locations; the existing high-voltage transmission line which crosses the site also limits the site uses and facility locations. In combination, these key elements and facilities limit adjustments to the location of the process plant due to the interconnected project operating systems. The three other evaluated alternative plant sites are located along the proposed access/ancillary facilities corridor between the proposed action site and the main local access road (Figure 2). In general, a decrease in railway/roadway and infrastructure length is matched by a corresponding increase in project waterlines, solution pipelines and access requirements within the site. For all resource areas except visual quality and cultural resources, the three other process plant alternative sites were found to cause negligible differences in impacts when compared to the proposed site. Adverse cultural resources impacts and visual impacts were expected to increase slightly for the other three alternatives, and hydrology would remain the single significantly-impacted resource area for all the alternatives.

Other alternatives relating to processing changes, different ore body locations, off-site gypsum washing, truck-only transportation, underground or open-pit mining methods, and solar evaporation of extracted well solutions were assessed and not analyzed in detail due to significant environmental sensitivity or feasibility considerations.

The proposed action evaluated in the Draft EIS/EIR included the process plant to be located in Section 25 (see Figure 2). Subsequent to issuance of the Draft EIS/EIR, the owner of the property (Southern California Edison Company) has indicated that it no longer is willing to have the process plant located on its property. The Alternative #3 process plant site in Section 30 (see Figure 2) is considered the next best location. Because the originally proposed site is unavailable, the proposed action has been modified to include the Alternative #3 process plant site. A request has been submitted to U.S. Fish and Wildlife Service to amend the Biological Opinion to reflect this not-significant modification to the proposed action. Impacts to desert tortoise habitat would be equal to or less than the originally proposed location; no additional habitat compensation would be required.

The BLM has also requested that a formal Endangered Species Act conference be initiated for the project relative to effects on proposed critical habitat for the desert tortoise as the proposed project is located within proposed critical habitat boundaries. The Section 7 consultation (Biological Opinion) for the proposed project indicated that the proposed action did not constitute a threat to the continued existence of the desert tortoise.



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ALTERNATIVE SITES

Fort Cady EIS / EIR
Fort Cady Minerals Corporation
Newberry Springs, California
FIGURE 2

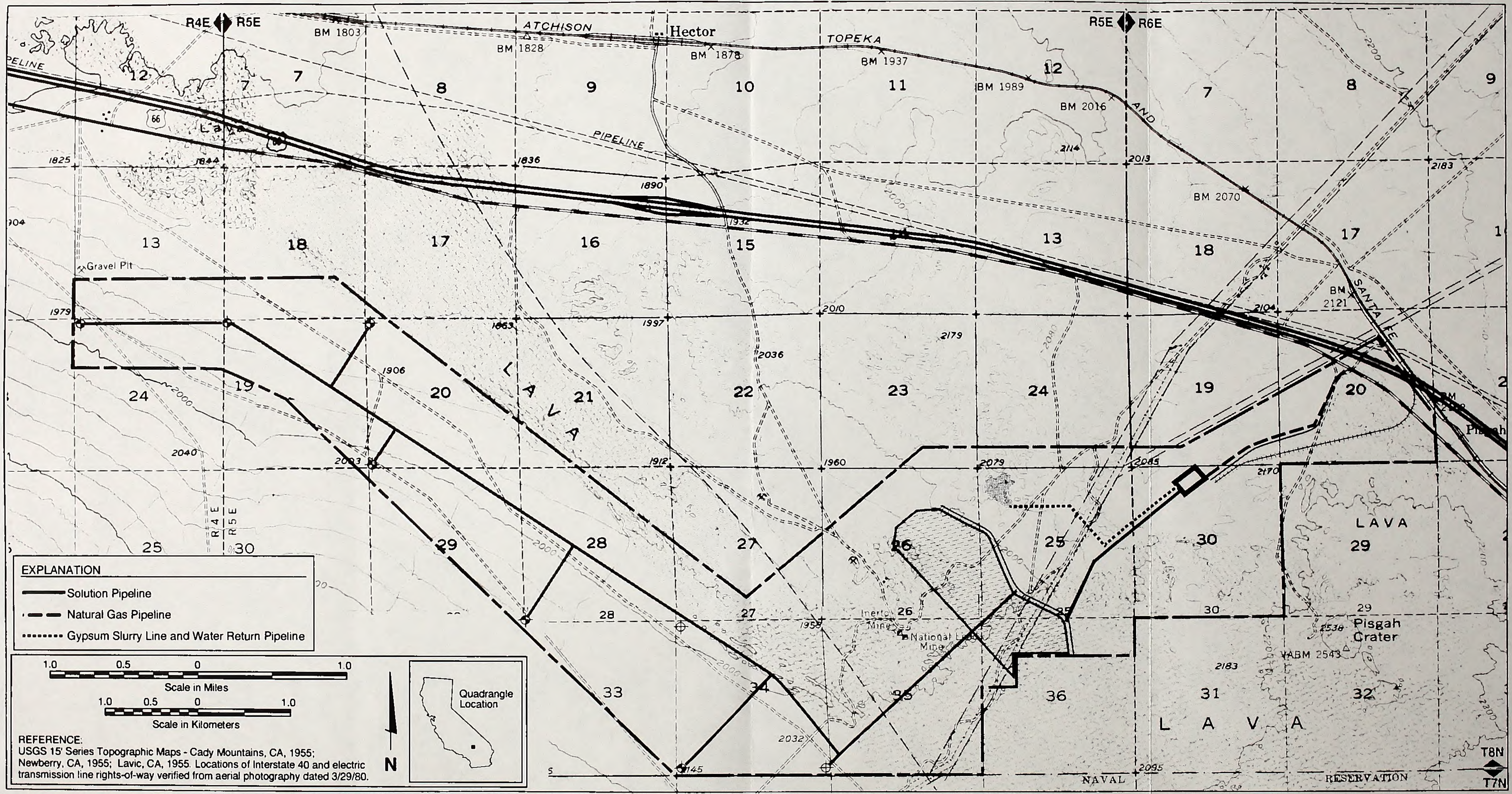
ENVIRONMENTALLY PREFERRED AND SUPERIOR ALTERNATIVE

Under the National Environmental Policy Act (NEPA), as directed by the Council on Environmental Quality, 40 CFR 1502.14(e), federal agencies are required to identify the agencies' preferred alternative. BLM has evaluated all alternatives taking into account BLM policies, land use plans (particularly the California Desert Conservation Area Plan; CDCA), and the results of the environmental analysis in this EIS/EIR. The proposed action, as modified by the change in the process plant location (see Figure 3), is consistent with BLM policies regarding mining and with the CDCA. The environmental analysis has not identified feasible alternatives with less impacts than the modified proposed action. Therefore, the modified proposed action is BLM's preferred alternative.

Section 15126(d)(2) of the California Environmental Quality Act (CEQA) requires that the lead agency (state or local) for preparation of an EIR identify an environmentally superior alternative. If the No Action alternative is the environmentally superior alternative, then the identification is to be made from the other alternatives considered. In the case of the FCMC modified proposed action, the No Action alternative would be environmentally superior. Based on the results of the analyses for other alternatives summarized above, the modified proposed action is considered environmentally superior to the other alternatives.

ENVIRONMENTAL CONSEQUENCES AND MITIGATION OF THE PREFERRED ALTERNATIVE

Table 1 presents the potentially significant impacts resulting from the construction, operation, and closure of the proposed action; mitigation measures proposed to reduce the level of significance of these impacts; and a determination of the significance of impacts after implementation of the proposed mitigation measures. Significant impacts from this project that may not be mitigated to nonsignificance include those associated with an increase in the consumption of groundwater and potential land use conflicts with the proposed ACEC designation for the area. Significant impacts which would be mitigated to nonsignificance are associated with disturbance of desert tortoise habitat.



REFERENCE:
USGS 15' Series Topographic Maps - Cady Mountains, CA, 1955; Newberry, CA, 1955; Lavic, CA, 1955. Locations of Interstate 40 and electric transmission line rights-of-way verified from aerial photography dated 3/29/80.

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21864-001-001

ENVIRONMENTALLY PREFERRED ALTERNATIVE

Fort Cady EIS/EIR
Fort Cady Minerals Corporation
Newberry Springs, California

FIGURE 3

TABLE 1
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
GEOLOGY:		
Construction and closure activities would result in areas with a heightened susceptibility to wind or water erosion.	•Disturbed areas shall be reclaimed.	Not significant.
HYDROLOGY:		
Consumptive groundwater use would be approximately 161 acre-feet per year, which would lead to local drawdown of the aquifer and may exceed the estimated safe yield of the aquifer.	•Elimination of the evaporative pond technology. •No additional substantial mitigation is possible. However, the following measures shall be implemented in order to provide additional assurance that adjacent aquifers are not affected by migration of mining process solutions: • Additional monitoring of piezometric levels within the mining area and vicinity shall be carried out and the hydraulic gradient in the ore zone area would be evaluated. • Following completion of mining activities, and as part of closure, extraction wells shall be pumped to remove formation fluids until low-pH fluids have been removed and fluids of normal pH are produced. • Recycled water shall be used to reduce a total water consumption during operational activities.	Significant.

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
CLIMATE AND AIR QUALITY:		
Emissions of SO_2, NO_x, CO, ROG, and PM_{10} from combustion emissions from use of heavy-duty equipment, and fugitive dust emissions from earth-moving activities and vehicular travel over dirt and gravel roads.	•Construction shall be curtailed during high winds (i.e., 10m/sec). •Exposed, disturbed surfaces shall be watered and/or revegetated as soon as practical to prevent wind-blown dust. •Vehicular dust generation on access roads shall be minimized by applying water or approved dust pallatives to all unpaved roads. •A speed limit of 15 mph shall be posted and enforced on all unpaved roads. •The contractor shall establish physical barriers to define the construction site and limit unnecessary disturbance beyond the actual construction zone. •Construction equipment shall be maintained as per manufacturer's specifications.	Not significant.
Emissions of NO_x, ROG, CO, SO_2, and PM_{10} from point and mobile sources would increase during operation.	•The operator shall implement an inspection and maintenance program to reduce fugitive emissions from organic solvent handling equipment (i.e., valves, flanges, and pumps). •The operator shall implement a ridesharing program to reduce commuter vehicle trips. •Optimal combustion conditions shall be maintained on driers and the cogeneration facility in order to reduce emissions of air pollutants. •The baghouse dust collection system, used for PM_{10} removal, shall be inspected, cleaned, and maintained regularly to promote maximum removal efficiency approaching system design levels. •The acid absorption system, shall be inspected, cleaned, and maintained regularly to promote maximum removal efficiency approaching system design levels. •Vehicular dust generation on access roads shall be minimized by applying water or approved dust pallatives on unpaved roads. •After the project is under operation, FCMC shall evaluate the feasibility of paving the main access road.	Not significant.
NOISE:		
No significant adverse impacts are expected.	•None required.	Not significant.

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
BIOLOGICAL RESOURCES:		
PLANTS: Construction and closure impacts on botanical resources would include removal of vegetation at facility sites and access roads; establishment of undesirable weedy vegetation; the compaction of soil which could lead to difficulty in reestablishing native vegetation. Operation impacts would include the potential for further degradation of plant habitat.	•At the end of the project, disturbed areas, including new access reads, shall be recontoured and reseeded with appropriate mixture of native plant species according to BLM specifications. •No onsite collection or killing of sensitive plant or wildlife species shall be permitted. •At least 30 days prior to construction activities, a survey shall be conducted by qualified biologists to identify sensitive species and record their location.	Not significant.

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
WILDLIFE: Construction and closure impacts on general wildlife and sensitive species would include loss or displacement of individual animals and sensitive desert tortoises; loss or degradation of habitat and habitat features; as well as the fragmentation of desert tortoise habitat. Operation impacts would include the potential for further degradation of wildlife habitat. The beneficial impact of increasing nighttime prey for the California leaf-nosed bat would also result during operation.	•The mine operator shall designate a field contact representative (FCR), with authority to halt all mining activities that are in violation of any stipulations, who shall be responsible for overseeing compliance with protective stipulations for the desert tortoise and coordination of compliance with the BLM and USFWS. •At least 30 days prior to construction activities, a survey shall be conducted by qualified biologists to identify sensitive species and record their location. •When maintenance activities occur outside of areas enclosed by desert tortoise-proof fences, work areas shall be surveyed by the authorized biologist prior to the onset of maintenance to determine whether desert tortoises are present. •A worker education program shall be implemented. •No on-site collection or killing of sensitive plant or wildlife species shall be permitted. •Travel shall be limited to approved roads and off-road use shall be prohibited. If desert tortoise-proof fencing is not constructed along the water pipeline, all project-associated vehicles shall maintain a speed limit of 15 mph on this access road. •When outside of areas enclosed by desert tortoise-proof fences, workers shall inspect underneath any parked vehicles immediately prior to moving the vehicles. •Land disturbance during construction shall be restricted to the smallest area required. •A trash abatement program shall be implemented. •Structures that may function as common raven nesting or perching sites shall not be authorized except as specifically stated by the BLM. •Contractor shall be responsible for post-construction clean-up. Following completion of construction, barriers shall be erected to limit traffic to the main access roads.	Not significant.

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
WILDLIFE (con't.)	•Hazardous material spills, including spills of oils, coolants, grease, diesel fuel, and gasoline shall be cleaned up immediately and the hazardous materials removed. Maintenance yards and containment areas shall be cleaned at the end of the project. •A final inspection shall be conducted to evaluate additional impact to desert tortoise habitat and no later than 90 days after completion of construction activities, the FCR and authorized biologist shall prepare a report for the BLM and CDFG. •Acid solution resulting from spill areas shall be promptly neutralized and cleaned-up to prevent animals and birds from ingesting the solution. •After site rehabilitation, all desert tortoise-proof fence shall be removed. •The sides of the gypsum deposition area shall be gently sloped so as to reduce the possibility of entrapment or drowning. •If feasible, construction shall take place during periods when tortoises are least active. •An authorized biologist shall be required on-site during pre-construction and construction activities which could harm desert tortoises. •An authorized biologist shall maintain a record of all desert tortoises encountered during mining activities. •Construction sites shall be surveyed 30 days, 72 hours, and again immediately prior to the commencement of construction activities. •In general, desert tortoises shall be moved the minimum distance possible to ensure their safety. •Only qualified biologists shall handle tortoises, and accepted protocol for marking and displacement of tortoises shall be followed.	

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
WILDLIFE (con't.)	•An authorized biologist shall instruct appropriate mine employees in the proper method of handling desert tortoises in the event of emergencies involving animals during routine operation of the facility; or FCMC shall retain a local, BLM/USFWS-authorized biologist available on short notice. •All project facilities shall be enclosed within desert tortoise-proof fences. •After fence installation, an authorized biologist shall conduct a thorough survey for desert tortoises within all enclosed areas. •Desert tortoises moved from within a fenced site shall be marked for future identification. •A protocol specific to handling of hatchlings shall be developed. •Reduction of habitat fragmentation caused by the above-ground pipeline shall be accomplished by periodic elevation or burial of the pipeline, or construction of ramps over the pipeline. •Reduction of habitat fragmentation shall be reduced through the installation of culverts or underpasses under the access roads and the railroad at all washes and at 0.5 mile intervals. •Pets, especially dogs, shall not be permitted on site. •345 acres of off-site desert tortoise habitat lands shall be transferred to the BLM by the proponent to compensate for unmitigated desert tortoise impacts.	

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
LAND USE/RECREATION:		
An inconsistency between the proposed process plant building height and the planning policies of the County Rural Conservation Land Use District and the Airport Hazard Overlay Zone would result during operation. Variances shall be filed and are expected to be approved.	• No mitigation required.	Not significant.
Conflicts between the land use of the proposed action and the research/education purposes of the proposed Pisgah Crater Area of Critical Environmental Concern would result from operation.	•Sensitive areas shall be avoided and above-ground pipelines shall be raised approximately one foot from the ground to reduce impacts to wildlife mobility and habitat fragmentation.	Potentially significant.
VISUAL RESOURCES:		
No significant adverse impacts are expected.	•None required. Although no significant adverse impacts are expected, adverse visual impacts shall be mitigated according to the overall goals of the BLM Visual Resource Management Program. Measures include: ✓ Landform screening shall be incorporated wherever feasible; ✓ Surface disturbances shall be minimized, especially those which highlight lava/soil contrasts; ✓ Structure colors shall blend with predominant background colors using non or low reflectance materials; ✓ Night-lighting shall be shielded to minimize off-site glare and visibility; ✓ Implementation of Reclamation Plan measures for vegetation and soil disturbances; and ✓ Graded surfaces shall gradually blend the color, texture, and contour of adjacent sand and lava surfaces.	Not significant.
TRANSPORTATION:		
No significant adverse impacts are expected.	None required.	Not significant.

TABLE 1 (cont'd.)
POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

IMPACTS	MITIGATION MEASURES	RESIDUAL IMPACTS
CULTURAL RESOURCES:		
Impacts on cultural resources, including destruction or displacement of cultural deposits and loss of scientific information could occur during construction.	•Cultural resources determined eligible for the National Register shall be avoided or mitigated. •If previously unidentified cultural resources are encountered, construction activities shall be halted until a qualified archaeologist is consulted regarding the significance of the finds. The BLM shall be notified and concerned Native Americans shall be involved, where appropriate. •Worker and visitor education with respect to not disturbing cultural resources shall be implemented.	Not significant.
PALEONTOLOGICAL RESOURCES:		
Fossils could be subject to destruction and loss during construction.	•A paleontologist shall spot check construction activities in areas where paleontological resources are most likely to be found. •Worker education with respect to the potential for uncovering fossil remains and the legal protection such fossils are afforded shall be implemented.	Not significant.
SOCIOECONOMICS:		
No significant adverse impacts are expected.	•None required.	Not significant.
EROSION:		
Impacts caused by surface runoff following cloudbursts.	•Interceptor and drainage ditches shall be designed with dispersion features that minimize erosion potential.	No significant.

PART II

ADDITIONS/CHANGES TO DEIS/EIR

12.0 Acronyms 12-1

13.0 Glossary 13-1

Appendix A — Notice of Intent

Appendix B — Notice of Preparation

Appendix C — Biological Opinion and Amendment

Appendix D — Cultural Resources Report . . . . On File with Lead Agencies

Appendix E — Biological Resources Report . . . . On File with Lead Agencies

Appendix F — Mining and Land Reclamation Plan

Appendix G — Paleontologic Resource Management Plan and Report . . On File with Lead Agencies

ES.7 OTHER REQUIRED CONSIDERATIONS

Six other projects have been identified within the vicinity of the Fort Cady project which could cumulatively affect future resources. Projects include ongoing~~an~~ expansion of the existing Hector Mine operated by Rheox, Inc. located adjacent to the project site; the currently inactive Twin Mountain cinder mine at Pisgah Crater; two proposed hazardous-waste treatment facilities and repositories — Broadwell Corporation's proposal for Broadwell dry lake and Hidden Valley Resource's proposal for the Mountains, and a proposed Naval Facilities Command Tactical Vehicle Trail, and a waste management facility. Potentially significant adverse cumulative impacts are expected for geology, hydrology, air quality, biology, cultural, and paleontological resources. However, with the implementation of project-specific mitigation measures, all significant adverse impacts are expected to be mitigated to a less-than-significant status with the exception of hydrology and land use. Consumptive use of groundwater would remain an unavoidable significant adverse impact. Potentially significant land use conflicts with the proposed Area of Critical Environmental Concern designation for the area may necessitate additional mitigation measures to be identified during the ACEC management planning process~~not be mitigable~~.

No significant long-term risks to health and safety are expected to result from implementation of the proposed action. In addition, the short-term use of the environment necessary for the proposed action is not expected to result in significant long-term adverse impacts on the productivity of the environment.

Irreversible commitments of natural resources required by this project would include direct consumption of the colemanite ore body; fossil fuels used for transportation and boric acid processing; natural gas used to fire the cogeneration plant; and electrical energy required for the operation of the proposed action. Given the relatively small scale of the project, these impacts would be adverse but not significant. The use of the project site land is also not considered an irreversible impact because the removal of the facilities and the reclamation of the site would ultimately place the site to nearly its original pre-project condition.

Growth-inducing impacts associated with the incremental income and spending associated with the project are not expected to be significant. No major immigration of new households is expected in the Barstow/Newberry Springs area, and the multiplier effect from project-related spending is expected to be small.

TABLE 1.5-1
LIST OF PERMITS AND APPROVALS

Required Permit/Approval	Agency/Authority	Purpose
FEDERAL		
Plan of Operations	Bureau of Land Management	Mine and Reclamation Plan Approval
Cultural Resource Permit (Section 106, Consultation)	Bureau of Land Management, State Historic Preservation Office, National Advisory Council on Historic Preservation	Investigation to determine potential for National Register of Historic Places inclusion
Right-of-Way Grants and Notices to Proceed	Bureau of Land Management	Road and rail access, electric power, gas pipeline, and water line rights-of-way
Emergency Fire, Evacuation and Rescue Plans	Department of Labor, Mine Safety, and Health Administration	Plans required for surface operations
Notice of Start of Operations	Department of Labor, Mine Safety, and Health Administration	Notice must be filed for location and ownership
Legal Identity Report	Department of Labor, Mine Safety, and Health Administration	Report on type of operation, location and ownership
Record of Inspection of Self-Propelled Equipment	Department of Labor, Mine Safety, and Health Administration	Must be maintained for six months and available to inspectors
Record of Testing the Resistance of Electrical Ground System	Department of Labor, Mine Safety, and Health Administration	Test required annually and after installation, repair, or modification. Record of tests must be available to inspectors.
Biological Assessment and Habitat Conservation Plan (Section 7, Consultation)	Fish and Wildlife Service	Evaluate threatened and endangered species impacts.
STATE OF CALIFORNIA		
Waste Discharge Permit	Lahontan Regional Water Quality Control Board	Surface and groundwater quality control
Mine Waste Management	Lahontan Regional Water Quality Control Board	Classification of hazardous/non-hazardous waste and determination of geochemical behavior
Storm Water Permit	Lahontan Regional Water Quality Control Board	Control storm water runoff during construction
Dam Safety Permit	Department of Water Resources, Division of Safety of Dams	Certify gypsum pond dam structural/seismic requirements
2081 Management Agreement	Department of Fish and Game	Evaluate threatened and endangered species impacts

2.2.1.1 WELL FIELD FACILITIES

The well field area would disturb approximately 273 acres and would ultimately be comprised of up to approximately 200 wells. The well field configuration is depicted in Figure 2.2-1. Each well would be capable of operation in both the injection and recovery modes. Over time, as ore reserves are exhausted in specific localities, new wells would be drilled to replace those which are depleted. With reserves sufficient for 130 years, mining expansion into the area west of Pisgah Fault would not occur with this project. Therefore, no injection wells are proposed or planned in that area.

Materials used for well casings would consist of 4.5- to 6-inch diameter fiberglass and/or plastic pipe installed to the top of the ore body at a depth of approximately 1,400 feet. The casing would be held in place by forcing cement down its center and up through the space between it and the drill hole bore. In the basalt area, if needed, wells would have a surface conductor of 10-inch steel tubing to maintain drilling mud circulation through the lava. Wells would be installed to conform with the regulations of San Bernardino County.

After the cement has set for at least two days, the well would be completed by drilling out the remaining cement in the casing and drilling through to the bottom of the ore. Underreaming to enlarge the well bore surface area may be employed to facilitate extraction. Each well would be equipped with a flow meter and pressure gauge.

The well field would be operated in a "push and pull" mode, whereby the injection solution would first be injected into the well and then allowed to remain in the formation for a period of four to 12 hours to facilitate its reaction with the ore body. The pH of a sample of solution withdrawn from the well would be tested, and if it is found to be low (i.e., the solution is still acidic), the injection solution would be left in the well for a longer period of time. Once the chemical reaction is thought to have reached equilibrium, the boron-rich solution would be recovered by use of submersible pumps and pumped to the processing plant. With this mode of operation, approximately one third of the wells would be in the injection mode, one third in the reaction mode, and the remaining third in the recovery mode.

The well field would be equipped with above-ground, eight-inch plastic trunk lines and a series of lateral collector lines to deliver injection solution and return recovery solution.

2.2.1.3 GYPSUM DEPOSITION AREA

Gypsum, a by-product of the boric acid mining operation, would be pumped in the form of a slurry from the process plant to the center of the gypsum deposition area. The water in which the gypsum will be pumped will be adjusted to a neutral pH. Neutralized water will percolate slowly out of the mounded deposit of gypsum and flow, via natural drainage patterns, to a low spot at the southern edge of the area. Water will be collected from this area and returned to the plant by a pump and pipeline system for reuse. This ponded area will be relatively small as water will be continually returned to the plant. Water loss is expected to be 60 to 80 gpm through evaporation and evapotranspiration due to the high average temperatures and prevailing wind patterns in the area. The minerals and salts in the water will be removed during the boron extraction; therefore, the quality of the water used in the slurry is expected to be high. Gypsum, a calcium sulfate compound, is virtually insoluble in water (L. Ordway, 1992) and a quantitative analysis of the leachate solution completed by WCAS found no metals approaching legal Resource Conservation and Recovery Act (RCRA) limits. Tables 2.2-3 and 2.2-4 show the results of chemical analysis of gypsum produced during pilot mining for CAM metals in TCLP leachate and total metals. These analyses indicate that the gypsum produced as a byproduct of the borate mining operation constitutes a non-hazardous product.

In the gypsum deposition area, gypsum would be impounded prior to being sold; i.e., to the local cement industry or the soil conditioning industry. Negotiations with interested purchasers are in progress. FCMC has contacted prospective buyers for the gypsum and believes, based on these contacts, that the gypsum is marketable. Marketing commitments have been received from one chemical supply company. Discussions have also been conducted with at least two other companies interested in purchasing the gypsum. These companies have performed chemical analyses on Fort Cady Minerals Corporation gypsum produced during onsite pilot testing and have confirmed the gypsum to be high quality material of which they are interested in buying. If the gypsum cannot be sold, it would be transported to a gypsum mine, and if this is not feasible, it would be given to a manufacturer of wall board. The gypsum deposition area is sufficiently large to store the product during possible periods of unfavorable marketing conditions. The gypsum deposition area would be approximately 16 acres in size and would include one dam constructed of in-place materials. The current location of the deposition area is based on requirements established by the U.S. Fish and Wildlife Service Biological Opinion for the Project, which is found in Appendix C of this document. The height of the dam would be no greater than 37 feet. Plastic liners would be placed on the side of the dams that would be in contact with the gypsum slurry and the dam would be constructed in accordance with California Division of Dam Safety requirements. No liner would be placed on the bottom of the deposition area. The Lahontan Regional Water Quality Control Board (RWQCB) has been requested by FCMC to grant a waiver

for waste discharge requirements for the gypsum deposition area because the gypsum to be stored in the area is considered a saleable product rather than a waste.

The gypsum slurry would be delivered via an above-ground pipeline (six inches in diameter) leading to the area from the process plant. Over time, the gypsum would settle, and water would be removed from the top of the pond and returned to the process plant via an above-ground water return pipeline. This pipeline would be four inches in diameter and approximately one-half mile long.

2.2.1.4 WATER SUPPLY WELL NETWORK

Approximately 150,000 gallons per day (or 0.46 acre feet per day, for a total of approximately 161 acre feet per year) of process water would be required for the proposed action in order to wash the gypsum produced, and for use in cooling, fire protection, and various sanitary uses.

The above-ground main water delivery line would have a diameter of three inches, and the above-ground delivery lines from the individual wells to this main delivery line would be three inches or less in diameter, depending upon the yield of the individual wells. Water lines would be constructed of either black plexed pipe or yellow-lined plastic. The distance from the farthest well to the process plant would be approximately seven~~eight~~ miles. An application for the Federal Land Policy and Management Act Title V right-of-way for the water pipeline was filed with the BLM on July 9, 1990. The water well locations and transmission pipeline routes have been located on mill site claims HMS 1 through 128 and 130 through 474. These claims were filed with the BLM on September 18, 1989, and have been assigned California Mining Claim serial numbers 229645 through 230117.

2.2.1.5 RAILROAD SPUR, NATURAL GAS PIPELINE, AND ACCESS ROADS

The railroad spur is estimated to be approximately 2.4 miles long and would extend from the process plant to the Atchison Topeka and Santa Fe (AT&SF) Railroad line to the northeast of the project site.

The natural gas pipeline would be approximately two miles in length. The pipeline would be constructed between the process plant and the existing Pacific Gas and Electric Company (PG&E) main line. The tie-in would occur at the underpass of Pisgah Crater Road and I-40. The four-inch pipeline would be buried approximately 42 inches underground. It would parallel Pisgah Crater Road on the west side and follow the FCMC access road to the project site.

crew. Three to five of the drill rigs would typically be involved in drilling the production wells while the remaining two to four rigs would complete the construction of the wells (i.e., drill out cement, flush and clean the hole, etc.). However, if production wells are not available for completion, the remaining rigs would also be employed in drilling wells. Approximately three delivery trucks containing mud, casing, cement, and drill bits are expected to arrive weekly during the construction of the well field. A discussion of truck traffic associated with the construction of the proposed action is presented in Section 4.1.8.2.

CONSTRUCTION OF THE PROCESS PLANT AND GYPSUM DEPOSITION AREA

Construction of the process plant would require an average of 25 full-time employees. It is anticipated that the processing facilities within the building would be constructed prior to the construction of the office and maintenance facilities. The building would be constructed, equipment installation would take place, and facilities would be connected and hydrochecked to see that they operate properly. External surfaces would be of non or low reflectance materials.

The gypsum deposition area would be constructed after initial site preparation is completed and the well field and processing plant construction crews are engaged. Approximately 10 construction employees are expected to require one month to complete construction of the gypsum deposition area. The slurry delivery line, interceptor ditch, and water return lines to and from the gypsum deposition area would be among the last facilities to be installed before start-up. Design of the interceptor ditch would include drainage features approved by the BLM authorizing officer to minimize erosion potential.

CONSTRUCTION OF THE PROCESS WATER SUPPLY WELL NETWORK

Installation of the process water supply well network would follow the procedures described for the well field drilling program above. Similar equipment and crew size would be used to drill and complete the water wells.

Two of the process water supply wells already exist (in the southeast and the northwest corners of section 34), having been installed during the earlier pilot plant testing period. Additional wells would be drilled as they are needed and up to five~~seven~~ wells may be in operation at any given time during production, depending upon the process water demand and the individual well yield. If a process water supply well fails to produce the required water volume, another well would be drilled nearby to replace the depleted well.

Each well would be equipped with a pump and water delivery pipe joining the main water delivery line which leads to the process water surge tank located in the process plant. Pipelines would be constructed of non or low reflective materials.

The well field construction crew would install the process water network to connect the well field with the process plant as one of its first tasks to provide an ample supply of process (non-potable) water to mix with drill mud for use in well drilling.

CONSTRUCTION OF THE RAILROAD SPUR, NATURAL GAS PIPELINE, AND ACCESS ROAD

The main access road would be one of the first of the facilities to be completed. It would be constructed of base materials and gravel and would require eight construction workers and one month to complete. The railroad spur would be constructed according to AT&SF specifications by a railroad contractor and engineering firm hired by FCMC. The natural gas pipeline would be constructed by PG&E. Design of the drainage swale between the access road and the railraod spur would include dispersal features, approved by the BLM authorizing officer, that minimize erosion potential.

2.2.2.2 CONSTRUCTION WASTES

The proposed action would generate small volumes of solid and liquid wastes during construction. Wastes would be stored, recycled, or disposed of in accordance with the rules and regulations of the appropriate regulatory agency. Domestic garbage would be hauled to the County landfill facility. Hazardous wastes would be limited to spent motor oil, which would be hauled by a licensed hauler with appropriate manifest records being maintained. Types of waste anticipated are presented in Table 2.2-6. Acids are not considered waste because they would be recycled through the system on a continuous basis.

2.2.2.3 CONSTRUCTION WORK FORCE, SCHEDULE, AND COSTS

Construction of the proposed action would require a maximum of 76 employees at any one time and nine months to complete. This would entail labor costs of approximately $3,510,000. Construction would be scheduled for normal business hours, therefore without premium pay, as much as possible. However, due to the extreme afternoon temperatures during the summer months in this area, early morning hours may be substituted.

TABLE 2.2-6
ANTICIPATED PROJECT WASTE TYPES

Waste Type	Source Material	Disposal Procedure
Domestic waste	Paper, plastic, glass, foods	San Bernardino County Landfill
Industrial (non-hazardous)	Concrete, plastic/fiberglass pipe	San Bernardino County Landfill
Industrial (hazardous)	Spent oil	Licensed recycler

2.2.3 OPERATION OF THE PROPOSED ACTION

To extract the borates, acid solution is injected into a well and allowed to remain in the formation for a period of 4 to 12 hours to facilitate its reaction with the ore body. Once the chemical reaction is thought to reach equilibrium, the boron-rich solution is pumped from the well. Because this mining method involves chemical reactions that reach equilibrium, the portion of the ore body being mined is very localized (i.e., limited in extent). This is the reason why as many wells (about 200) would be needed over the life of the project. The reason project plans include a buffer zone of at least 300 feet to be maintained between mining wells and the project boundary is to restrict mineral extraction to areas within project ownership.

2.2.3.1 OPERATION OF THE MINING PROCESS AND THE PROCESSING FACILITIES

Due to the difficulty and extensive time necessary for start-up and shut-down of the integrated process, operations would be continued 24 hours a day, seven days a week, 365 days per year. This continuous operation is anticipated for both the well field and the process plant.

The well field may be operated in a continuous manner, with acid solution being injected into some of the wells while boron-rich solution is recovered from other wells. During mining operations, control of the injection of the leaching solution would be maintained via valves and pumps on the injection manifold. The valves may be controlled either automatically from the process plant area or manually at the well location. Each well would be programmed for a certain volume of injection fluid (depending upon conditions described in Section 2.2.2.1 above) and monitored to ensure that the correct amount is injected. After the injection solution has remained in a particular well for the optimal amount of time (typically four to 12 hours), the boron-rich solution would be recovered and pumped to the process plant. This would be controlled by the operation of valves and pumps located on the recovery manifold. As with the injection manifold, the valves and pumps may be controlled either from the process plant or manually at the well location. All pipes are located on the surface. Pipes would be routinely visually inspected for leakage, and the pressure gauges would be monitored for pressure declines.

Typically, each crew would have one or two operators assigned to the well field to patrol the area and ensure that all equipment is functioning properly, that injection and recovery at each well is being managed correctly, and a "balanced" well field is in operation. A balanced well field exists when a similar amount of solution is being injected as is being recovered. Ideally, slightly more solution is recovered than injected: this positive balance ensures that a small influx of water is

flow into the settling chamber where the boron-rich organic solvent, being lighter than water, would float to the top.

The boron-rich solvent would be skimmed from the top of the aqueous solution and would be directed next to the stripping facility. Here, boron would be removed from the organic solvent using water or a weak (approximately five percent) acid solution.

After stripping, the solvent would be returned to the loading cells in the stripping facility and the process would continue in a continuous mode. The concentrated boric acid solution would then be routed to the purification/crystallization and product loading facilities. The well field solution, from which the boric acid has been removed, would be routed to the acid regeneration facility, from there it would be reinjected into the well field for further boron recovery.

There are no waste streams in this circuit. The solvent is continuously circulated in a closed loop between the loading and stripping reactions, hence no continuous bleeding operation is required. If the solvent becomes too concentrated with impurities, it is scrubbed using well field injection solution and then centrifuged. The resulting impurities are recycled to the well field for subsequent leaching. The resulting cleaned solvent is then routed back to the extraction circuit.

The various plant facilities would operate more or less simultaneously. Operating instructions would be disseminated by management, and supervision would exist at the various plant facilities in order to maintain proper operational conditions. Where possible, process criteria would be monitored by computer, and alarms would be triggered if operating limits are exceeded. Visual inspection for dripping and slow leaks would also take place. Solvent mixing tanks, settling tanks, and vessels would be covered and the vapors vented to the cogeneration plant (waste heat boiler) for incineration.

PURIFICATION/CRYSTALLIZATION

The boric acid solution produced in the stripping facility would be crystallized in the purification/crystallization facility in order to separate the boric acid from the solution. The barren solution would then be rerouted back to the stripping cells of the solvent extraction section for additional stripping.

The boron-rich solution emerging from the stripping section would be a purified boric acid solution, which would be sent to the crystallization unit. Here, the solution would be cooled using vacuum crystallization technology, and the result would be a pure product of boric acid crystals.

The particulate impurities would be either returned to the acid regeneration facility or routed to the gypsum deposition area, depending upon the relative solubility of the material.

of the ore reserves underlying the well, the boron-rich solution would be removed from the ore body and the entire process repeated as described above.

PRODUCT LOADING AND SHIPPING

In the product loading and shipping facility, the boric acid crystals would be sent first to the centrifuge, where the majority of the water would be removed. From the centrifuge, they would be conveyed to the natural gas-fired dryer, which would remove the remaining moisture. The product dryer maximum head input is 11 MMBTU/hr. When the product is dry, it would be sorted by size through the use of sizing screens. The dried and screened boric acid crystals would then be delivered to a bagging system which would produce 80- or 100-pound bags of shrink-wrapped product. Typically, the filled bags are placed on pallets within the process plant and can be loaded onto trucks or railroad cars using fork lifts and conveyor equipment. Alternately, the product can be routed to bulk loading dock facilities, from which bulk trucks or railroad cars can be loaded.

Equipment within the product loading and shipping facility that may produce dust emissions would be outfitted with high-efficiency dust collection equipment specifically designed to meet the emission specifications of the San Bernardino County Air Pollution Control District (SBCAPCD). An ongoing maintenance program would govern the proper operation of the dust prevention units.

GYPSUM PRODUCT

As described above in Section 2.2.1.3, gypsum would be stored in the gypsum deposition area prior to being sold, for example, to the cement or soil conditioning industries.

YEARS OF PRODUCTION

The estimated size of the ore reserve is approximately 9,392,000 tons. The boric acid product makes up 6.11 percent of this ore. Therefore, at an annual production rate of 90,000 tons of boric acid, the ore would be consumed at a rate of 50,670 tons per year. At this rate, and assuming that approximately 70 percent of the ore body would be recoverable, sufficient reserves exist to allow for approximately 130 years of boric acid production, as shown below.

$$\frac{(9{,}392{,}000 \text{ tons ore reserve}) \times (0.7 \text{ ore recovery})}{50{,}670 \text{ tons recovery per year}} = 129.75 \text{ years}$$

3. A "suggestion box" would be available to workers throughout the facility so that anyone could submit suggestions on ways to improve the operation, especially with respect to reducing environmental impacts.

4. An equipment inspection and maintenance program would be implemented to minimize emissions from fuel-burning equipment.

2.3 PROJECT ALTERNATIVES

2.3.1 PROCESS PLANT SITING CONSIDERATIONS

The process plant should be as close as possible to the in-place ore deposit. SCE will not allow railroad activity under their high voltage transmission lines; therefore, the processing plant must be located east of the transmission lines. Assuming also that maximum use of existing roads remains a primary concern, thus minimizing impact of building additional access mileage, the plant must be located on or west of Pisgah Crater Road. Additionally, by locating the process plant anywhere east of the proposed site location, visual impacts to the north are increased due to the low topographical relief of the area.

Moving the process site further from the ore body (which cannot be moved) would increase the total length of access roads to both the well field and the gypsum deposition area. The associated pipeline distances would also increase. Longer pipelines have an increased possibility of pipe failure that could result in accidental releases of process fluids to the environment.

The process plant could not be located on top of the lava flow in the area without excessively increasing construction costs.~~ and causing potentially significant adverse impacts to the lava flow, a BLM-designated Research Natural Area.~~

2.3.2 ALTERNATIVE PROCESS PLANT LOCATIONS

The siting constraints discussed above limit possibly suitable alternative locations for the process plant. Three alternative locations have been identified that may satisfy the siting constraints and are evaluated in further detail in this document. These sites are located in the northeastern portion of Section 30, the southwestern portion of Section 19, and the southeastern portion of Section 20. Specific site locations and associated reconfigurations of linear facilities (road, railroad spur,

where wells had reported depths to groundwater ranging from approximately 145 to 348 feet bgs. Based on this, and the inferred groundwater barriers formed by similar faults elsewhere in the region, it is probable that Fault B also provides some degree of restriction to movement of groundwater. This seems particularly likely due to the presence of abundant clay-rich sediments on the west side of the fault, which tend to form a particularly impermeable gouge in fault zones.

3.2.2.6 GROUNDWATER QUALITY

Groundwater quality in the project area and vicinity is generally poor, based on data reviewed. Most groundwater samples exceeded the recommended drinking water standards of 1,000 milligrams per liter (mg/L) for Total Dissolved Solids (TDS) and 1 mg/L for boron. Review of DWR data indicates that fluoride concentrations also exceed recommended standards in the southeast Newberry groundwater basin (western project area). In taking action on the pilot project, the May 12, 1988 Regional Water Quality Control Board Order No. 6-88-63 (WDID 68368020008) stated in Item 25 (page 4) that "the groundwater located at the project site is inferior for domestic purposes with TDS and fluoride concentrations exceeding recommended drinking water standards."

CENTRAL PROJECT AREA

Chemical analysis of seepage water from the upper part of the claystone in this area was not available, but relatively high TDS concentrations are to be expected based on the observed presence of evaporite minerals in shallow near-surface and surface sediments in the central project area.

Analysis of formation water extracted from the ore (mining) zone wells indicates that the fluid is, as would be expected, highly saline, with TDS concentrations ranging from 23,300 to 29,800 milligrams per liter (mg/L) in Well SMT-1 over the period March 1981 through April 1981. A sample taken from Well P-2 in July 1987 had a TDS content of 25,400 mg/L and boron was reported at 530 mg/L. Computer modeling of the chemical parameters of the water from two of the ore zone wells (described more fully in Section 4.1.2) indicates that the ore zone fluids were supersaturated with respect to anhydrite, gypsum, calcite, and aragonite. Supersaturation with respect to dolomite and celestite were also reported in some of the samples. It is believed that the ore zone fluids are also saturated to supersaturated with respect to colemanite. Higher TDS values have been reported from other fluid samples obtained from the ore zone area. As discussed in Section 4.1.2, these higher TDS samples were collected during or following pilot mining tests and are believed to represent injected acidic solution that remained in the well area.

TABLE 3.5-1

PLANT SPECIES OBSERVED ON DESERT TORTOISE SURVEYS[1]

FAMILY	SCIENTIFIC NAME[2]	COMMON NAME[2]
AGAVACEAE	*Yucca schidigera*	Mohave Yucca
AMARANTHACEAE	*Tidestromia oblongifolia*	Honey sweet
APOCYNACEAE	*Amsonia tomentosa*	Dogbane
ASTERACEAE	*Ambrosia dumosa*	White-bursage
	Baileya pleniradiata	Wooly desert marigold
	Bebbia juncea	Sweetbush
	Encelia frutescens	Rayless encelia~~Desert bush sunflower~~
	Hymenoclea salsola	Cheesebush
	Malacothrix glabrata	Desert dandelion
	Pectis papposa	Chinch weed
BORAGINACEAE	*Coldenia plicata*	Plicate coldenia
CACTACEAE	*Echinocactus polycephalus*	Cottontop
	Opuntia basilaris	Beavertail cactus
	Opuntia echinocarpa	Silver cholla~~Staghorn cholla~~
	Opuntia ramosissima	Lead pencil cholla
CAPPARACEAE	*Cleomella obtusfolia*	Blunt-leaf stinkweed
	Isomeris arborea	Bladder pod
CHENOPODIACEAE	*Atriplex canescens*	Wingscale
	Atriplex hymenelytra	Desert holly
	Atriplex polycarpa	Allscale
	Ceratoides (=Eurotia) lanata	Winterfat
	Salsola iberica	Russian thistle
CUCURBITACEAE	*Cucurbita palmata*	Palmate-leaved gourd
EPHEDRACEAE	*Ephedra californica*	California joint fir
EUPHORBIACEAE	*Eremocarpus setigerus*	Dove weed
	Euphorbia micromeria	Sonoran sand-mat
	Euphorbia polycarpa	Small-seeded sand-mat
FABACEAE	*Acacia greggii*	Catclaw
	Cassia armata	Desert ~~Armed~~senna
	Dalea fremontii	Indigobush
	Dalea spinosa	Smoke tree
GERANIACEAE	*Erodium cicutarium*	Red-stem filaree
HYDROPHYLLACEAE	*Phacelia distans*	Wild heliotrope~~Common phacelia~~
KRAMERIACEAE	*Krameria parvifolia*	Little-leaved ratany
LAMIACEAE	*Salazaria mexicana*	Bladder sage
MALVACEAE	*Sphaeralcea emoryi*	Emory's desert mallow
NYCTAGINACEAE	*Allionia incarnata*	Windmills
	Mirabilis bigelovii	Wishbone bush
ONAGRACEAE	*Oenothera deltoides*	Dune~~Large desert~~ evening primrose
	Oenothera primiveris	Large yellow desert ~~evening~~ primrose
POACEAE	*Bouteloua aristidoides*	Needle grama

	Bouteloua barbata	Six-weeks grama
	Erioneuron pulchellum	Fluff grass
	Hilaria rigida	Big galleta grass
	Schismus arabicus	Abu mashi
	Stipa speciosa	Desert needlegrass
POLYGONACEAE	*Chorizanthe rigida*	Rigid spiny herb
	Eriogonum deflexum	Skeleton weed
	Eriogonum inflatum	Desert trumpet
SOLANACEAE	*Lycium andersonii*	Anderson box-thorn
	Nicotiana trigonophylla	Desert tobacco
	Physalis crassifolia	Ground cherry
TAMARICACEAE	*Tamarix* sp.	Tamarisk
ZYGOPHYLLACEAE	*Larrea tridentata*	Creosote bush
	Tributus terestris	Puncture vine

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[1] Species observed during surveys of August-September, 1989; May-June, 1990; and November, 1991.

[2] Scientific and common names follow Munz (1974) and Jaeger (1969).

the horned lark *(Eremophila alpestris),* common raven *(Corvus corax),* loggerhead shrike *(Lanius ludovicianus),* common poorwill *(Phalaenoptilus nuttallii),* greater roadrunner *(Geococcys californianus),* cactus wren *(Campylorhynchus bruenneicapillus),* and black-tailed gnat catcher *(Polioptila melanura).* LeConte's thrasher *(Toxostoma lecontei),* a known resident on the site, is classified by the CDFG as a species of special concern.

Creosote bush scrub habitat supports numerous mammalian species. The coyote *(Canus latrans),* desert kit fox *(Vulpes macrotis arsipus),* and badger *(Taxidea taxus)* are the larger species found in the project area. Small herbivores include the desert woodrat *(Neotoma lepida),* desert kangaroo rat *(Dipodomys deserti),* white-tailed antelope squirrel *(Ammospermophilus leucurus),* deer mouse *(Peromyscus maniculatus),* desert cottontail *(Sylvilagus audubonii),* and black-tailed hare *(Lepus californicus).* These latter species constitute much of the diets of mammalian, avian, and reptilian predators in the area. Almost a dozen bats have the potential to occur in the project area, according to range maps and habitat usage. Of these there are two, the California leaf-nosed bat *(Macrotus californicus),* and the spotted bat *(Euderma maculatum),* which are Federal candidate species. A comprehensive list of all wildlife observed during field surveys of the project area is shown in Table 3.5-2.

3.5.1.3 RESEARCH NATURAL AREA / PROPOSED AREA OF CRITICAL ENVIRONMENTAL CONCERN

The Fort Cady project area lies partially within an area which was proposed in 1992 as an Area of Critical Environmental Concern (ACEC). Pending evaluation of the area as an ACEC, the area continues to have interim status as a Research Natural Area, as identified in the CDCA plan. The CDCA plan indicates the Research Natural Area extends from the Pisgah Crater through the project area to I-40. This area is characterized by lava flows with drifting sand, alternating with sandy valleys. This creates a unique environment where animals normally associated with rocky areas, such as chuckwalla and desert night lizard, and animals normally associated with sandy areas, such as fringe-toed lizards, and valley bottom species, such as western whiptails, desert tortoises, and sidewinders, are found together.

3.5.1.4 STREAMBED CROSSINGS

Streambed crossings may require a 1603 Streambed Alteration Agreement from the California Department of Fish and Game (CDFG). This regulation is generally applied to blue lines and other fluvial systems with the bed and banks noted on USGS quadrangle maps, even if the waterway is an ephemeral stream. Twelve such blue lines exist within the project area. If

Seven additional sensitive species are known, or have the potential, to occur in the project area. One lizard, three birds, and three mammals are Federal candidates and/or State-protected species, including the prairie falcon, LeConte's thrasher, the Loggerhead shrike, Nelson's bighorn sheep, the California leaf-nosed bat, the spotted bat, and the common chuckwalla.

Among these species, the prairie falcon is a State-protected bird, but has no other sensitivity status. LeConte's thrasher is a CDFG Species of Special Concern, Priority 3 (CSC-3) species. This indicates that it is not currently in danger of extirpation; however, due to its small population in California, it is vulnerable to threats. The Loggerhead shrike is a C2 species whose range includes most of the Southwestern United States and Mexico. Nelson's bighorn sheep, a locally rare game animal found in the Cady Mountains, ten miles to the north of the project site, has been designated sensitive by the BLM. The California leaf-nosed bat is a candidate (C2) for Federal protection. Caves, abandoned mines, and abandoned buildings are its usual roost-site during the day. Little is known about the distribution of the spotted bat, also a C2 species, in the region. It may occur on a rare to uncommon basis, particularly near riparian habitat. Its occurrence in the project area, therefore, is highly unlikely given the lack of riparian habitat. Both the California leaf-nosed bat and the spotted bat are designated as sensitive by the BLM. The prairie falcon and LeConte's thrasher were both seen during field surveys (Lilburn, 1990; Dames & Moore, 1991).

3.5.2.3 DESERT TORTOISE

Biological surveys in the project area indicate that the primary wildlife resource concerns are those associated with the declining Mojave desert tortoise population. The decline is probably due to a number of reasons, including a disease condition exacerbated by the stress of several drought seasons, loss of habitat, predation by ravens, and direct disturbance by humans. In response to these declines, the USFWS listed the Mojave population of the desert tortoise as a threatened species (USFWS, 1990c).

Desert tortoise occurrence and mitigation in the project area are addressed in a Biological Assessment (Dames & Moore, 1991) and Biological Opinions (USFWS, 1992 and 1993). Information was developed from previous BLM data, previous survey sources, literature sources, and intensive walk-over and triangular strip surveys conducted on the project area in August and September, 1989; May and June, 1990; and early November, 1991.

hydrofracturing of the ore body in the immediate vicinity of the well bottoms, reducing the injection pressures would mitigate this impact. In addition, construction techniques would be designed to withstand ground motions of non-project-induced seismic activity.

Impacts related to increased erosion may be mitigated by claiming disturbed areas to reduce the erosion potential.

4.1.2 HYDROLOGIC IMPACTS

4.1.2.1 CONSTRUCTION IMPACTS

Potential impacts to surface water during construction are related to minor alteration of the surface drainage patterns~~, which could result in flooding and erosion~~ (see Section 4.1.1 for further discussion). Use of standard~~appropriate~~ engineering practices during construction~~, however,~~ can avoid minor~~mitigate~~ flooding and erosion hazards. This impact is considered adverse but~~, with mitigation, it is~~ not significant.

Intermittent use of water for dust control and other construction-related activities would occur for short time periods and would have a minor effect on groundwater supplies. Because of the small magnitude of the effect, this impact is adverse but not significant.

4.1.2.2 OPERATION IMPACTS

Potential impacts during project operation are related to degradation of the subsurface ore zone formation water as a result of mining operations; drawdown and depletion of the aquifer in the supply wellfield area in the western portion of the project site; and degradation of groundwater or surface waters as a result of release of gypsum or other substances within the project area.

DEGRADATION OF ORE ZONE FORMATION WATER

Degradation of usable groundwater in water-bearing formations located adjacent to the block of mudstone comprising the central project area, due to infiltration of affected ore zone fluids, is not considered likely, due to (1) the impermeability of the mudstones surrounding the ore body and the apparent barriers to groundwater movement provided by the faults which bound the mudstone block, and (2) the neutralizing effect minerals in the formation would have on any acidic mining fluids which escape extraction. These two factors are discussed in the following sections.

or industrial water, due to the high concentration of TDS and other constituents. For this reason a potential increase in chloride or a temporary increase in isooctanol, as discussed above and in the previous section, is not considered to represent a significant impact. Further, a high degree of geologic containment of the formation water within the ore zone is believed to exist, as discussed above. For these reasons, degradation of water quality in water-bearing formations adjacent to the block of mudstone comprising the central project area, due to infiltration of mining process fluids, is not considered likely. Consequently, this potential impact is considered adverse but not significant. No amendment to the Basin Plan is expected to be required.

EVALUATION OF GYPSUM STORAGE GROUNDWATER QUALITY IMPACTS

Gypsum and gypsum slurry will be stored in an unlined gypsum deposition area (Section 2.2.1.3). The gypsum is composed predominantly of calcium sulfate, and there is no evidence of the presence of hazardous constituents in the gypsum, including metals, as demonstrated by chemical analysis of gypsum produced during pilot studies.

While it is likely that some fluids saturated with calcium sulfate may percolate into the subsurface from the gypsum deposition area, the risk of any impact on groundwater at the site is very low, as the upper saturated zone is not only over 300 feet below the ground surface, but the gypsum deposition area is underlain by very low-permeability mudstones (Section 3.2.2.3), making it unlikely that surface gypsum would have any impact on underlying formation water. In addition, gypsum occurs naturally in the sediments immediately below the proposed gypsum deposition area location. Also, formation water is presently supersaturated with gypsum and saline, with no beneficial uses (Section 3.2.2.6).

CONSUMPTIVE USE OF GROUNDWATER

The hydrogeologic impact due to groundwater extraction at the site was estimated (1) in terms of estimated safe yield and (2) in terms of maximum water table drawdown as a result of constant pumping at an average rate of 100 gallons per minute (gpm), the approximate amount of groundwater required for project operations.

For estimation of maximum drawdown two scenarios were assumed: five wells pumping at the rate of 20 gpm, and one well pumping at an average rate of 100 gpm. As can be seen from equation (2) in Section 3.2.2.4, for the case of a constant rate of pumping, maximum drawdown

occurs at the pumping well when the hydraulic conductivity value is at a minimum value and when the radius of influence is at a maximum value. In the following calculations the minimum hydraulic conductivity value of 1.6 feet/day and maximum radii of influence were used.

In the first scenario it was assumed that the five wells were located 1 mile apart. In this case the maximum radius of influence was approximately 2,000 feet (approximately 1/2 mile), resulting in a maximum drawdown of 7.3 feet at each well. In the second scenario, the maximum radius of influence was 12,500 feet (approximately 2-1/2 miles). In this case, the maximum drawdown at the pumping well was estimated to be 45.6 feet. These drawdown calculations were based on available data, and consequently there is a relatively high level of uncertainty associated with them, as discussed in Section 3.2.2.4.

The estimated safe yield of the aquifer in the area of the supply well network is estimated to be between 163 and 405 acre-feet annually. As noted in Section 3.2.2.4, there is a relatively high level of uncertainty associated with this estimate, which is based on available data. Planned consumptive groundwater use by the Rheox, Inc. facility would be approximately 14.6 acre-feet of groundwater per year. If Rheox, Inc. encounters any problems with pumping water from their wells, FCMC has agreed to provide Rheox, Inc. with water from FCMC wells. Consumptive groundwater use by the proposed action would be approximately 161 acre-feet annually. Total consumptive use is approximately 176 acre-feet annually.

Based on the above discussions, it appears that drawdown of the aquifer would occur locally and that the estimated safe yield of the aquifer may be exceeded. This impact is considered adverse, significant, and unmitigated.

DEGRADATION OF SURFACE WATER

The proposed action includes a holding area for gypsum that would be produced as a byproduct of the boric acid mining process. This area is sited in a low area ~~between two low hills~~ in the north-central project area, and would be bordered on the ~~north and~~ south by an earthen containment dam~~s~~. Subsurface soil sampling and testing will be conducted to confirm soil conditions in the gypsum holding area prior to construction of the containment dam~~s~~. The side~~s~~ of the holding area dam~~s~~ would be covered with an impenetrable barrier material to prevent leaching of dissolved gypsum into surface water or soil. The gypsum would be kept continuously wet. It is possible

4.1.2.4 MITIGATION MEASURES

SURFACE WATER

Potential impacts to surface water during construction, operation, and closure due to alteration of surface drainage patterns can be mitigated by implementation of proper engineering reclamation design to prevent flooding and erosion.

GROUNDWATER

Impacts to areas of usable groundwater due to migration of mining process solutions from the ore zone area are not expected to occur, as discussed in Section 3.2. However, the following measures would be implemented in order to provide additional assurance that such migration would not affect aquifers in adjacent groundwater basins:

- Additional monitoring of piezometric levels within the mining area and vicinity would be carried out and the hydraulic gradient in the ore zone area would be evaluated. Monitoring wells would be installed in a downgradient direction from the ore zone and monitored periodically to assess changes in formation water chemistry, if any, to evaluate any changes which may result from migration of mining process solution. In addition, samples from selected water supply wells adjacent to the Pisgah fault would be periodically analyzed for chemical changes, if any, which might indicate migration of mining process solutions from the mining area. If mining process solution constituents were detected, the RWQCB would be notified. A groundwater monitoring program would be developed in accordance with RWQCB requirements as part of the Waste Discharge Report permit process.

- Following completion of mining activities at the site, and as part of closure, extraction wells would be pumped to remove formation fluids until low-pH fluids have been removed and fluids of normal pH are produced. This would remove most of the affected formation water from the ore zone area. As discussed in Section 3.2, residual affected fluids remaining in the formation would be neutralized by evaporite and clay minerals in the formation, resulting in lowering of the pH and precipitation of minerals from the solution as pH is lowered, bringing the TDS into a range close to normal for the formation. The isooctanol component of the mining process fluid is believed to degrade relatively rapidly in the subsurface, as discussed in Section 4.1.2.2, and thus the isooctanol in any solution remaining in the formation would be degraded.

4.1.4.4 MITIGATION

No mitigation measures are necessary.

4.1.5 BIOLOGICAL RESOURCES

4.1.5.1 CONSTRUCTION IMPACTS

BOTANICAL RESOURCES:

Construction activities associated with the proposed action would lead to the following impacts to botanical resources:

- The removal of vegetation at facility sites and access roads, including the permanent loss of an estimated 345~~356~~ acres of desert habitat and the temporary loss of four acres of desert habitat. Four acres is the estimated amount of land that would quickly regenerate, e.g., roadsides. Due to the large amount of creosote bush scrub in the area, the conversion of this land to developed uses is considered an adverse but not significant impact to botanical resources.

- The establishment of undesirable weedy vegetation, which may result in adverse, potentially significant impacts on sensitive species by increasing competition for limited habitat and soil moisture. With implementation of appropriate mitigation measures (see Section 4.1.5.4), this impact would not be significant.

- The compaction of soil, which could lead to difficulty in re-establishment of native plant species. This impact would be considered adverse and potentially significant; however, with implementation of appropriate mitigation measures (see Section 4.1.5.4), this impact would not be significant.

- The removal of individuals or small populations of sensitive plant species. No State or Federally-listed plant species are expected to be affected. Small populations of Crucifixion thorn and Utah Cynanchum (both listed by the CNPS; see Table 3.5-3) exist in the Project area; however, these populations exist only outside site areas proposed for development. Neither species is expected to be disturbed by construction of the Proposed Project. No other sensitive plant species are expected to be affected.

- The removal of 341 acres of tortoise habitat features such as cover, forage, and established burrows, and 4 acres of habitat temporarily eliminated. This impact would be considered adverse and potentially significant. However, with implementation of appropriate mitigation measures (see Section 4.1.5.4), this impact would not be significant.

- The fragmentation of desert tortoise habitat. Barriers to tortoise movement could be presented by access roads and above-ground pipelines, resulting in desert tortoise habitat fragmentation. Juvenile or sub-adult tortoises may be unable to cross, and even large adult tortoises could have difficulty crossing above-ground pipelines. This impact would be considered adverse and potentially significant; however, with implementation of appropriate mitigation measures (see Section 4.1.5.4), this impact would not be significant.

PROPOSED AREA OF CRITICAL ENVIRONMENTAL CONCERN

Potential significant adverse impacts to the area include the loss or disturbance of research study sites or areas that may have educational value within the BLM proposed Area of Critical Environmental Concern (ACEC). This would represent an adverse, potentially significant impact. Additional mitigation measures may be identified during the ACEC management planning process if the ACEC is designated.

4.1.5.2 OPERATION IMPACTS

Activities during operation of the proposed action would lead to the following impacts to biological resources:

- ~~An increase in nighttime insect prey in the area.~~ Night lighting would attract insects and result in an increased concentration of nighttime insect prey in the area. ~~The California leaf-nosed bat,~~ The spotted bat and nocturnal insect-hunting birds may benefit from the night lighting and consequent increased supply of insects in the project area. This impact is considered beneficial.

- ~~Degradation of habitat (including desert tortoise habitat) due to soil disturbance, increased levels of noise, traffic, equipment movement, fluid leakage, dust, and human presence. This would occur over time, allowing for plant and animal acclimation to the new habitat conditions. Therefore, the resulting impact would be considered adverse but not significant.~~

- Degradation of habitat (including desert tortoise habitat) would occur due to soil disturbance, increased levels of noise, traffic, equipment movement, possible fluid leakage, dust, and human presence. The low level of activity anticipated for this type of mining operation would result in minimal effects for these operational impacts and they would be primarily confined to the site.

construction is not feasible, the authorized biologist shall be present at all times that hazards to desert tortoises exist.

- An employee education program must be received, reviewed, and approved by the BLM at least 15 days prior to the presentation of the program. The program may consist of a class or video presented by a qualified biologist (BLM or contracted). Wallet-size cards with important information for workers to carry are recommended. All mine employees and contractors shall participate in the desert tortoise education program prior to initiation of mining activities. The operator shall be responsible for ensuring that the education program is developed and presented prior to conducting activities. New employees shall receive formal, approved training prior to working on-site. The program shall cover the following topics, at a minimum:
  - distribution of the desert tortoise,
  - general behavior and ecology of the desert tortoise,
  - sensitivity to human activities,
  - legal protection,
  - penalties for violations of State or federal laws,
  - reporting requirements, and
  - project protective mitigation measures.

- No on-site collection or killing of sensitive plant or wildlife species shall be permitted. Sensitive wildlife species found in the construction zone shall be removed by a qualified biologist. These animals shall be released in adjacent areas of similar habitat. Sensitive plant species shall be transplanted to a suitable nearby habitat under the direction of a botanist.

- Travel shall be limited to approved access roads and off-road use prohibited. A speed limit of 15~~20~~ miles per hour shall be maintained by all employees and contractors of FCMC on all project roads that are not protected by desert tortoise-proof fencing.

- If desert tortoise-proof fencing is not constructed along the water pipeline, all project-associated vehicles shall maintain a speed limit of 15~~20~~ miles per hour on this access road. The water pipeline shall be either buried or elevated for at least 100 feet every 1/4 to 1/2 mile to allow for the passage of desert tortoises. If the pipeline is elevated, the BLM shall ensure that the height of elevation will allow for the free passage of the largest possible desert tortoise.

could be built over the pipe approximately every one-half mile; or the pipe could be elevated one foot above the ground.

- The BLM shall ensure that common ravens do not nest on any structures erected by FCMC. Any above-ground utility poles shall be designed and installed to preclude nesting by common ravens. If common ravens construct nests on its facilities, FCMC or the BLM shall be responsible for obtaining the appropriate permit from the USFWS's Division of Law Enforcement to remove the nests. The BLM shall also ensure that FCMC monitors common raven use in the vicinity of the proposed facility in accordance with standard BLM raven-monitoring techniques.

- Fragmentation of desert tortoise habitat shall be reduced through the installation of culverts or underpasses under the access roads and the railroad at all washes and at 0.5-mile intervals. Culvert size, location, and installation shall be in accordance with methods developed by the BLM/s Desert Tortoise Research Group. Culverts or underpasses shall be maintained to remove trash and other debris at least twice per year and to ensure that they are in all ways passable to desert tortoises, prior to its spring and late summer activity periods.

- Pets, especially dogs, shall not be permitted on site, thereby reducing the possibility of harassment of tortoises, tortoise fatalities, or the destruction of tortoise habitat.

- At the end of the project, disturbed areas, including new access roads, shall be recontoured and reseeded with an appropriate mixture of native plant species according to BLM specifications. After site rehabilitation, all desert tortoise-proof fences shall be removed.

- The project proponent shall acquire and transfer to the BLM 345~~341~~ acres of off-site desert tortoise habitat lands to compensate for the unmitigated impacts of the project on the desert tortoise. All compensation lands shall be within BLM-designated Category I Tortoise habitat within the West Mojave Region and shall be approved by the BLM prior to satisfaction of this requirement. Acquisition of compensation lands shall be coordinated through the BLM/s California Desert District Realty Staff. Compensation requirements must be satisfied within one year of mining plan authorization. The original Fort Cady project habitat compensation was recalculated by the BLM, based on a revised formula adopted on October 15, 1992. The

existing transmission line corridors in order to alleviate low-flight hazards; the processing plant location satisfies this requirement due to its close proximity to the east side of the area's transmission line corridor. Therefore, this impact would not be considered significant, and no additional written approvals (other than the County permit) or hearings would be required.

Adverse impacts associated with conflicts between the proposed action and the research/education purposes of the proposed Pisgah Crater ACEC designation could be potentially significant if proposed facilities degrade or destroy existing research projects or special features associated with on-going education visits. The proposed ACEC designation is currently being evaluated. If the designation is approved, BLM will prepare a Management Plan for the area. This Plan would identify potential conflicts with existing or proposed uses in the area and specify mitigation that would be required to resolve conflicts. All activities would be consistent with this Management Plan.

The Cady Mountains Wilderness Study Area (WSA) is approximately 5 miles north and east of the project area. The proposed project is not expected to have a potentially significant impact on this WSA because: (1) the separation distance is large; (2) views from the WSA toward the project already include manmade changes in the landscape (power lines, I-40, railroad, Rheox mine); and (3) measures are included to mitigate the visual impacts of the process plant (whether at the proposed or alternative locations) to a non-significant level.

California Desert Conservation Area Plan

Proposed facilities located within the Special Area as defined by the CDCA Plan include all of the proposed facilities, with the exception of the water wells and the associated above-ground piping. Potentially significant adverse impacts are identified in Section 4.1.5 for Biological Resources as a result of conflicts with facilities and research projects or educational features. Mitigation measures described in Section 4.1.5.4 would be incorporated to reduce impacts so that they are not significant. These measures would likely correlate with proposed measures to mitigate potentially significant adverse impacts to biological resources.

In addition, mining operations and facilities would again limit desert recreation in the project area through conversion of desert open space to industrial uses, but this is viewed as an adverse but not significant impact, due to the relatively low importance of off-road vehicular and hiking activities in the area.

The operation of the proposed mine is not expected to result in significant adverse impacts because it represents an expansion of the dominant existing industrial uses of the immediate surroundings rather than conversion to totally new uses.

4.1.6.3 CLOSURE IMPACTS

Impacts associated with closure (including disassembly of facilities and the construction procedures used to reclaim disturbed areas) may conflict with other land uses (such as off-road recreation). Conflicts should be minimal, however, and would be considered adverse but not significant. After closure is completed, the project site would be available for other uses consistent with the County

- The area of disturbed surfaces within lava flow areas would be minimized wherever possible to reduce the visibility of lava/soil contrasts; where disturbances are unavoidable, cut/fill slopes and graded surfaces shall gradually blend the color, texture, and contour of adjacent sand and lava surfaces.

- Visible disturbances in other areas would be minimized wherever possible. Grading for the railroad spur and access roads would be minimized; and access for all construction equipment would be restricted to the minimum area required for operations and maneuvering (see Biology Mitigation, Section 4.1.5.4).

- Materials used for external structures and pipeline surfaces will be non or low reflectance materials.

OPERATION

- A BLM plan which addresses vegetation and soil disturbances is on file with the BLM and San Bernardino County, and is available for public inspection.

- Structures shall be painted, stained, or built with materials using integral color to blend with the predominant background as viewed from the highway corridor and access road. Colors shall be chosen in conjunction with the BLM from their normal earth-tone color series.

- Project engineers shall be directed to locate and shield night-lights to minimize off-site glare and visibility.

CLOSURE

- Surface disturbances shall be regraded to lessen contrasts with form, line, and varied soil/sand/lava colors related to the unnatural linear project facilities. ~~Surfaces constructed in the gently rolling topography shall be flattened.~~

- A BLM plan which addresses closure issues related to site features and disturbances is on file with the BLM and San Bernardino County, and is available for public review.

6.0 RELATIONSHIP BETWEEN LOCAL AND SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Implementation of the proposed action would necessitate short-term use of the environment during the lifetime of the project. Potential environmental impacts associated with the project are discussed in Section 4.0. Mitigation measures shall be included in the project (see Section 4.0) to minimize potential environmental impacts. At the end of the project's operational lifetime, equipment would be removed and ground surfaces restored to conditions as near to those that existed prior to the facility's construction as is practicable. Recharge/recovery of the groundwater system is expected to occur within less than 1 year after water well pumping ceases. Therefore, short-term use of groundwater is not expected to have significant impacts on long-term productivity. If the ACEC designation is approved, BLM will prepare a Management Plan which will include mitigation measures to resolve possible conflicts with other uses in the area. As a result, there should be no decrease in potential beneficial uses of the environment. No significant long-term risks to health and safety are expected to result from implementation of the proposed action.

In summary, the short-term use of the environment necessary for the proposed action is not expected to result in significant long-term adverse impacts on the productivity of the environment.

	TABLE 4-1 PROCESS WATER ANALYSIS (Dames & Moore, 1993)				
Well No.	**Process Water MM-1 (West of Pisgah Fault)**				
BARIUM, mg/l	**1**	**ND**	**1**	**1**	**-**
BICARBONATE, mg/l	**115**	**116**	**122**	**122**	**-**
CARBONATE, mg/l	**-**	**-**	**-**	**1**	**-**
BORON, mg/l	**-**	**-**	**-**	**5**	**11.03**
BORATE (B_2O_3), mg/l	**-**	**-**	**-**	**1**	**-**
BORATE (HBO_3) (WET), mg/l	**-**	**-**	**-**	**-**	**-**
CADMIUM, mg/l	**-**	**ND**	**-**	**1**	**-**
CALCIUM, mg/l	**98**	**108**	**104**	**102**	**49**
CALCIUM (WET), mg/l	**-**	**-**	**-**	**-**	**-**

5. EROSION AND SEDIMENTATION CONTROL

Wind and water erosion and sedimentation will be controlled by several methods. Reclamation will emphasize grading practices that enhance the natural reestablishment of native vegetation. The disturbed areas of the site will be graded to eliminate rills and gullies. These areas will be regraded and imprinted to create non-uniform, rough surfaces in order to decrease wind velocities, increase seed and fines deposition and improve moisture collection. Materials (vegetative debris and rocks) that remain from the initial grading of project-related linear features, the gypsum deposition area, and the process plant will be redistributed in a non-uniform manner designed to decrease wind and water erosion and create habitat conducive~~conductive~~ to plant reestablishment. Snow fencing may also be used to create wind breaks. Seeding of native perennial species will also enhance site recovery and reduce erosion potential. Additional measures, such as the incorporation of growth enhancers or the installation of erosion control fabrics, may be required to control erosion. In addition, interceptor and drainage ditches would include design features to facilitate dispersal of runoff.

building, much of the site is visually blocked by a low ridge. The Process Plant building has a height of 50 feet, with associated storage silos up to 75 feet. Other facilities have a lower profile resulting in minimum visual impact from other vantage points (see Section 3.7 of the FCMC Solution Mining Project Draft EIS/EIR for more information) (Dames & Moore, 1993).

1.3 VEGETATION

Creosote bush scrub~~shrub~~ is the primary vegetative type in the project area. Two major community types, white bursage (Ambrosia dumosa) and creosote bush (Larrea tridentata) occur on the proposed project site. Other plants include bladder sage (Salazaria mexicana), cheesebush (Hymenoclea salsola), beavertail cactus (Opuntia basilaris), Anderson thornbush (Lycium andersonii), and Mohave yucca (Yucca schidigera). Appendix F contains a complete list of plant species observed during field surveys conducted in 1989 and 1990 (Dames & Moore, 1993). No Federal or State listed species are known or expected to occur in the project area, and there are no trees in the area (see Section 3.5 of the FCMC Solution Mining Project Draft EIS/EIR for more information) (Dames & Moore, 1993).

1.4 WILDLIFE

"The fauna associated with creosote bush scrub are adapted to desert scrub habitat with little cover and xeric conditions. Fish and amphibians are rare due to the scarce nature of surface water. Reptilian fauna, in contrast, are much more common and diverse. Special species of snakes occur in the project area, which are significant predators of the small mammals found in the area. Lizards are also expected on or near the project area. The desert tortoise (Xerobates [formerly Gopherus] agassezii), is also a year-round resident of the area."

"A wide variety of avian species may be found on or near the project area. Many breed in the area and are year-round residents, while others are seasonally abundant." Appendix F contains a complete list of wildlife species observed during field surveys conducted in 1989, 1990, and 1991 (see Section 3.5 of the FCMC Solution Mining Project Draft EIS/EIR for more information) (Dames & Moore, 1993).

"Based on literature review and reconnaissance field surveys, nine sensitive wildlife species are known or have the potential to occur in the project area. Of those, two are Federally-listed species (the desert tortoise and peregrine falcon). The desert tortoise is also State-listed as threatened, and the peregrine falcon is State-listed as endangered. A separate Biological Assessment for the desert tortoise was submitted to USFWS as part of the Section 7 consultation required by the Endangered Species Act, as amended" (see USFWS Biological Opinion, Appendix F).

"Seven additional sensitive species are known, or have the potential, to occur in the project area. One lizard, two birds, and four mammals are Federal candidates and/or state-protected species, including the prairie falcon, LeConte's thrasher, the desert kit fox, Nelson's bighorn sheep, the California leaf-nosed bat, the spotted bat, and the common chuckwalla."

2. RECLAMATION

2.1 PRE-CONSTRUCTION SURVEYS

A pre-construction baseline vegetation survey will be conducted within the disturbed area prior to construction to evaluate community characteristics and structure. The survey will be conducted

during peak flowering and fruiting periods to ensure correct species identification. This information will be essential to refinement of proposed revegetation prescriptions and to set realistic performance standards.

Diversity (species richness) and density of perennial vegetation for each community type proposed for disturbance are the currently accepted measurements of vegetative structure in the Mojave Desert. Cover is not considered to be an accurate measure of revegetation success. For many desert perennials, years may be required for above-ground biomass (canopy cover) to equal and exceed below-ground biomass.

It appears that two major community types, burrobush~~white bursage~~ (Ambrosia dumosa) and creosote bush (Larrea tridentata) occur on the proposed project site. Two permanent "control" plots will be located, one in each community, outside proposed areas of disturbance. These plots will be representative of vegetation occurring in areas proposed for construction and constitute "control" plots, by which reclaimed areas can be compared. Prior to actual reclamation, the undisturbed "control" plots will be resurveyed to evaluate changes in vegetative composition that may have occurred since project inception.

The exact location of the "control" plots will be determined following construction staking. Plots will be 100 yards squared, with grids on 10-yard intervals. At each intersection, a circular plot, two yards squared, will be measured. Sample size will be sufficient to produce at least an 80 percent confidence interval, for each grid sampled.

2.2 CONSTRUCTION PHASE

The proposed solution mine operation will cause relatively little grading and associated soil disturbance. Open pits, overburden dumps, tailings and mine waste, all frequently associated with large mining operations, will not occur as part of this project.

Significant surface disturbance and earth moving will be restricted to the gypsum deposition area (16 acres) and the processing plant (10 acres). Removal of a limited amount of vegetation will be required within the well field (273 acres). Disturbance of vegetation is also anticipated as a result of construction of the railroad spur (7.6 acres), new roads (16.7 acres), and the waterline (19.2 acres).

2.3 OPERATIONS

The process plant, gypsum deposition area, railroad spurs and access roads will remain active for the duration of the mine operation (approximately 130 years). It is expected that a market for the waste gypsum will be developed and that gypsum will be continuously exported.

2.4 OREBODY WELL FIELD CLOSURE

As the mineral reserves become depleted, wells will be destroyed and reclaimed. This process includes backfilling the casing with sand or pea gravel below 20 feet; sealing with impervious material (i.e., concrete or cement grout) in the upper 20-feet of the well; and backfilling the shaft with native soils (see permit requirements for well destruction, County of San Bernardino, Department of Environmental Health Services, January, 1990). The remaining surface disturbance will be revegetated in accordance with other specifications developed for that plant community type.

PART III

SCOPING AND PUBLIC COMMENTS AND RESPONSE

SCOPING AND PUBLIC COMMENTS AND RESPONSE

The BLM published its Notice of Intent (NOI) to prepare an EIS for the Fort Cady Project in the *Federal Register* on May 10, 1991. On January 4, 1991, the County of San Bernardino distributed its Notice of Preparation (NOP) of a Joint EIS/EIR for the Fort Cady Project. As federal lead agency, the BLM sponsored three public scoping meetings in the Fort Cady project area. Responses to these opportunities for scoping input for the EIS/EIR focused on the following concerns: dates of project operation; amount of land in use; extent of drilling; potential for contamination from the evaporation ponds (which have been eliminated from the revised project); depth the injected acid would penetrate before it is neutralized; effects on desert tortoises; air quality; dust problems; groundwater issues; project financial requirements and economic impacts; and number of jobs created by the project.

The Draft EIS/EIR was released for public review on June 4, 1993. A Notice of Availability (NOA) was published in the *Federal Register* on June 4, 1993. Public meetings to receive verbal comments on the Draft EIS/EIR were held on June 29, 1993 (Newberry Springs) and June 30, 1993 (San Bernardino); transcripts of the meetings are included in this document. The 60-day written comment period extended from June 4, 1993 through August 3, 1993.

This section includes all comments received during the 60-day written comment period, followed by responses to those comments.

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

JUL 1993
RECEIVED
BY

①

Jul 19, 1993

RENEE MOSHER
SAN BERNARDINO COUNTY PLANNING
385 NORTH ARROWHEAD AVENUE
SAN BERNADINO, CA 92415-0182

Subject: FORT CADY MINERAL CORPORATION'S MINERAL MINE
SCH # 91012074

Dear RENEE MOSHER:

① The State Clearinghouse submitted the above named environmental document to selected state agencies for review. The review period is closed and none of the state agencies have comments. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call Russell Colliau at (916) 445-0613 if you have any questions regarding the environmental review process. When contacting the Clearinghouse in this matter, please use the eight-digit State Clearinghouse number so that we may respond promptly.

Sincerely,

Christine Kinne

Christine Kinne
Acting Deputy Director, Permit Assistance

tate of California

Business, Transportation and Housing Agenc

②

Memorandum

To : State Clearinghouse
Office of Planning & Research
1400 10th Street
Sacramento, CA 95814

Attention: Russ Colliau

Date : July 22, 1993

File No.: 08-SBd-40-32-5

SCH# 91012074

From : DEPARTMENT OF TRANSPORTATION
District 8

Subject : Draft Environmental Impact Report Fort Cady Minerals Corp. Solution Mining Project

We have reviewed the above-referenced document and request consideration of the following comment:

① If the project involves transporting hazardous material, it will be required to comply with Federal and State regulation regarding the transportation of such materials on State highways.

If you have any questions, please contact Maisoon Afaneh at (909) 383-5928 or FAX (909) 383-5936.

Maisoon Afaneh for

HARVEY J. SAWYER, Chief
Transportation Planning
San Bernardino County
Coordination Branch

MA:jll\bd

STATE OF CALIFORNIA

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

PETE WILSON, *Governor*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814-7187

CHARLES WARREN
Executive Officer

Comment Letter
Fort Cady EIR

JUL 1993
RECEIVED

③

File Ref.: PRC 5906.2

Ms. Carol Whiteside
State Projects Coordinator
The Resources Agency
1020 Ninth Street
Sacramento, CA 95814

Mr. Randy Scott
County of San Bernardino
385 No. Arrowhead Ave. 3rd Floor
San Bernardino, CA 92415-0182

Ms. Edy Seehafer
Bureau of Land Management
150 Coolwater Lane
Barstow, CA 92311-3221

Dear Ms. Whiteside, Mr. Scott and Ms. Seehafer:

Staff of the State Lands Commission (SLC) has reviewed the Fort Cady Mineral Corporation (FCMC) Solution Mining Project Draft Environmental Impact Report/ Statement, SCH #91012074. Based on this review, we offer the following comments.

The proposed project area is immediately adjacent to a portion of Section 36, Township 8 North, Range 5 East, SBB&M, which is subject to a 100% mineral reservation to the State. This State interest parcel has been the subject of prior exploration drilling by the predecessor in interest to FCMC. There is evidence that a borate bearing mineral orebody exists in the State interest parcel and which may be an extension of the orebody as delineated by FCMC.

① The current project description calls for a line of injection/recovery wells along the boundary between the FCMC project land and the State interest parcel. As planned, these wells will very likely drain State minerals by action of the solution mining operations sweeping minerals from an area surrounding the well bores. FCMC should, therefore, contact Eric Kruger at (310) 590-5237.

Ms. Carol Whiteside
Mr. Randy Scott
Ms. Edy Sechafer

Thank you for the opportunity to comment.

Sincerely,

Mary Griggs

MARY GRIGGS
Environmental Review Section
Division of Environmental
Planning and Management

cc: Dwight E. Sanders
Eric Kruger
OPR

KENNETH M. REIM
MINING ENGINEER
2733 Billy Casper Drive
Las Vegas, NV 89134-7814

(702) 254-2764

RECEIVED
JUL 1993
BY

④

July 12, 1993

Mr. Ray Johnson
County of San Bernardino
Department of Planning
385 North Arrowhead Avenue
San Bernardino, California 92415

Re: Draft EIS/EIR for Fort Cady Minerals Corporation Solution Mining Project, June 1993

Dear Mr. Johnson:

I wish to make some comments on the above referenced Draft EIS/EIR as follows:

① In these type of reports, positive impacts should be listed first, if the project is worth doing. These reports generally have a negative tone which is misleading to the public. The positive impacts from primary and secondary employment are minimized is this report. I would say with the state of the economy of California and the United States, any increase of employment is beneficial.

- Government needs to ease the burden on our free enterprise system of developing new projects which creates more jobs which will the improve economy locally, and in the State of California and the United States. This is reportedly the goal of President Clinton's administration.

- The report as written adequately addresses the "significant issues" and environmental impacts as required by NEPA. Thus, the agencies should prepared a Final EIS/EIR and Record of Decision with a minimum effort, time and outside contractor assistance (minimize further unnecessary expenditures by agencies and applicant).

Please place me on your mailing list to receive all public notices, EIS/EIRs and related information on this project. Thank you for the opportunity to comment.

Sincerely,

Kenneth M Reim

Kenneth M. Reim

SAN BERNARDINO COUNTY MUSEUM

COUNTY OF SAN BERNARDI
GENERAL SERVICES GROU

2024 Orange Tree Lane • Redlands, CA 92374 • (714) 798-8570

DR. ALLAN D. GRIESEMER
Director

JUN 1993
RECEIVED
BY

(5)

June 17, 1993

San Bernardino County Planning Department
attn: Andrew Rush
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0182

re: **PALEONTOLOGIC RESOURCE MANAGEMENT PLAN AND REPORT FOR FORT CADY MINERALS CORPORATION BORIC ACID SOLUTION MINE**

Dear Mr. Rush:

(1) The proposed boric acid solution mine in San Bernardino County is located on sediments known to contain paleontologic resources. The paleontologic resource management plan prepared by Dames & Moore should be followed by Fort Cady Minerals Corporation during all phases of mining operations that could potentially impact paleontologic resources. The mitigation measures included in the report are developed along the guidelines of the Society of Vertebrate Paleontology and will satisfy the requirements of CEQA to protect non-renewable paleontologic resources.

Please do not hesitate to call with any questions you might have.

Sincerely,

Scott Springer

Scott Springer
Site Records Manager, Earth Sciences

⑥

RECEIVED
BUREAU OF LAND MANAGEMENT
93 JUN 14 PM 2:26
BARSTOW RESOURCE AREA
BARSTOW, CALIFORNIA

June 10, 1993

Bureau of Land Management
150 Coolwater Lane
Barstow, CA. 92311-3221

Attention: Ms. Edy Seehafer

Dear Ms. Seehafer

I have read the document entitled "Draft Environmental Impact/Environmental Impact Report, Fort Cady Minerals Corporation Solution Mining Project" and have the following comments concerning the report and project.

In general, I found most of the mitigation measures offered within the report to be rather vague statements with little substance. It seems as if many of the important issues in regard to the project are avoided. Although the document produced for the project is quite voluminous, I found it to be generally lacking in details on critical concerns. Some of these concerns are outlined as follows:

① -Will the project actually be able to sell the gypsum residue form the extraction process? Has a marketing study be performed or is this just an assumption? If the gypsum cannot be sold, what are the plans for its disposal? How much solvent and acid residue will be in the gypsum?

② -Will the regulatory agencies really allow FCMC to pump acid and solvents into the ground? The risk of potential groundwater contamination is not adequately addressed in this report. It seems that the attitude has been taken that since the water quality is supposedly poor, it is okay to contaminate it with acid and chemical solvents.

③ -FCMC states that there are sufficient reserves to support production for 130 years (pg. 2-25). How was this number arrived at based on the figures presented in the report?

④ -With a active fault in the project area, what assurance is there against pipe rupture during a seismic event?

⑤ -More detailed information is needed on the solvent extraction process. What are the waste streams from this process. Does the system need to be "bled" and where would that effluent go?

⑥ -The grade and thickness of the ore in this deposit in respect to the other deposits mentioned on pg. 2-50 should be presented for a valid comparison.

⑦ -The environment of the area has already been pressured by the existence of two nearby mining operations. The cumulative effects of an additional operation are not adequately addressed by the report.

⑧ -I was not aware that night lighting increases the population of insects as stated on pg. 4-32. Is it not more likely that the light simply attracts and concentrates insects in one area.

⑨ -The statement that because habitat degradation takes place over time thus allowing plant and animal species to adjust to new habitat conditions is used as a basis for declaring the impact as insignificant. This an unsubstantiated remark with little basis in reality.

I hope that these issues will be addressed in the final draft of the project EIS.

Sincerely,

Steve Baele
3577 Greenwood Avenue
Los Angeles, California 90066

⑦

State of California **THE RESOURCES AGENCY OF CALIFORNIA**

MEMORANDUM

To: Mr. Douglas P. Wheeler
Secretary for Resources

Ms. Edy Seehafer
Bureau of Land Management
150 Coolwater Lane
Barstow, CA 2311-3221

Date: July 14, 1993

RECEIVED
BUREAU OF LAND MANAGEMENT
93 JUL 19 PM 2:21
BARSTOW RESOURCE AREA
BARSTOW, CALIFORNIA

From: **Department of Conservation - Office of Governmental and Environmental Relations**

Subject: Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) for the Fort Cady Minerals Corporation Solution Mining Project.
SCH #91012074

The Mined-Land Reclamation Project staff of the Department of Conservation's Division of Mines and Geology (DMG) has reviewed the DEIR/EIS for the Fort Cady Minerals Corporation Solution Mining Project. The Notice of Preparation (NOP) was reviewed by DMG staff in February 1991. The Initial Study and Mining and Land Reclamation Plan were also reviewed at that time. The following comments are based on the information provided in the DEIR/EIS and the Revised Mining and Reclamation Plan, dated May 1993, included in Appendix F of the DEIR/EIS.

The Surface Mining and Reclamation Act of 1975 (SMARA - Public Resources Code (PRC) Sections 2710 et seq.) and the State Mining and Geology Board regulations for surface mining and reclamation practice (California Code of Regulations (CCR), Title 14, Chapter 8, Article 1, Sections 3500 et seq.) require that specific items be addressed or included in reclamation plans. ① All reclamation plans approved after January 15, 1993, reclamation must be in conformance with the Article 9 Reclamation Standards (Attached).

Mining Operation and Closure

(Refer to SMARA (PRC) Sections 2770.5, 2772(a),(b),(c),(d),(e),(f),(i),(j), 2773.1, CCR Section 3502(b)(2),(b)(5), 3709(a),(b), 3713(a),(b))

1. SMARA (PRC) Section 2772(f) requires that the reclamation plan describe the surface mining operation and provide a time schedule for completion of each segment of mining so that reclamation can be initiated at the earliest possible time on those portions of the mined lands that will not be subject to further disturbance by the surface mining operation. From the project description, extraction wells will be destroyed and reclaimed as the mineral reserves become depleted. Given the long period of time in which the site will operate (approximately 130 years), we recommend that the reclamation plan specify areas that will be

reclaimed during operations. Access roads no longer used in conjunction with the extraction wells could also be sequentially reclaimed with the wells. Areas of completed and current reclamation could then be identified during the annual SMARA inspections. Success of the reclamation treatments applied could be evaluated and the reclamation plan refined as needed. Successful reclamation would also allow the release of a portion of the financial assurances (SMARA Section 2773.1) held to ensure that reclamation is accomplished.

2. SMARA Section 2772(j) requires that the reclamation plan include a signed statement in which the person submitting the plan accepts responsibility for reclaiming the mined lands in accordance with the approved reclamation plan.

End Land Use

(Refer to SMARA Section 2772(g),(h), CCR Sections 3704(e), 3706(a), 3707 (a),(c), 3708

1. SMARA Section 2772(c) requires an initiation and termination date for the mine operation. The reclamation plan states that the mine can be expected to be active for approximately 130 years. We recommend that the lead agency approve the reclamation plan for a specific period of time, such as 10 years, with periodic review and renewal based on past compliance.

2. SMARA Section 2772(h) requires that the reclamation plan include a description of reclamation measures adequate for the proposed end use. The level of information provided in the reclamation plan is not adequate to assess the effectiveness of the proposed reclamation measures. For example, the reclamation plan states that "the reclaimed site will appear similar to preexisting conditions....and that "post-reclamation land use will not be in conflict with adjacent land uses." A detailed description of existing vegetation is not included in the plan; therefore, it is not possible to determine what "preexisting conditions" will be the standard for reclamation. Similarly, to describe post-reclamation land use as not being in conflict with adjacent land uses does not provide a goal toward which reclamation can proceed. We recommend that the reclamation plan clarify the end use to a specific type of end use, for example, wildlife habitat or open space, and that reclamation measures then be developed to achieve that end use. Due to duration of the proposed mine, it may be necessary to designate an interim end use for the project and base reclamation on this use. Until this information is provided, it will not be possible to assess the adequacy of the proposed reclamation measures.

Hydrology and Water Quality

(Refer to SMARA Sections 2772(h)(1),(h)(2), 2773(a), CCR Sections 3503(a)(3),(b)(1),(d), 3706(c),(d),(e),(f),(g), 3710 (b),(c), 3711(e), 3712)

1. CCR Sections 3706 and 3710 require that surface and ground waters be protected in accordance with Porter-Cologne and the Clean Water Acts as implemented by the Regional Water Quality Control Boards and the State Water Resource Control Board. Recent regulation approved by the State Water Resources Control Board require that a mine site which discharges storm water that has contacted any overburden, raw material, intermediate products, finished products, by-products, or waste products located on the mine site obtain a general industrial activities storm water permit and submit a Storm Water Pollution Prevention Plan (SWPPP).

   Page 5 of the reclamation plan indicates that Board Orders were adopted in 1981, 1982, and 1988 for the Pilot Project. It is not clear if these permits would extend to the project as currently proposed. The information, monitoring requirements, and water quality standards required by any Board Orders, permits, and the SWPPP should be incorporated into the reclamation plan.

2. CCR Section 3706 also requires that erosion and sedimentation be controlled during all phases of mining and reclamation, and provides performance standards for drainage, diversion structures, waterways, and erosion control. The reclamation plan indicates that erosion control would be initiated when needed and states that erosion would be controlled by grading, seeding, growth enhancers, or installation of erosion control fabrics. Specific erosion control facility design criteria are not included in the reclamation plan.

   Erosion control measures employed on site should be designed to handle runoff from not less than a 20 year/1 hour intensity storm event. The reclamation plan should provide data to demonstrate that the facilities proposed are adequately designed to control erosion and sedimentation during the mining phases and reclamation. Design specifications, placement, and maintenance procedures for erosion and sediment control facilities should be included in an erosion control plan. The erosion control plan should show proposed interim and final drainage patterns. The erosion control plan requirements of SMARA may be met by the SWPPP required by the State Water Resources Control Board. Evaluation of the effectiveness of the erosion control plan should be done as part of the SMARA annual inspection. The erosion and sediment control plan should be prepared by a registered civil engineer and/or engineering geologist.

Environmental Setting and Protection of Fish and Wildlife Habitat

(Refer to CCR Sections 3502(b)(1), 3503(c), 3703 (a),(b),(c), 3704(g), 3705(a), 3706(a),(f),(g), 3710(a),(b),(c),(d), 3713(b)

②

1. Under the Proposed Mitigation Measures, the Draft EIR/EIS states that a maximum speed of 15 miles per hour would be maintained along the water pipeline if desert tortoise fencing is not installed. In Section 4.1.5.4, however, the maximum speed is stated at 20 miles per hour. We recommend that this discrepancy be corrected.

Resoiling and Revegetation

(Refer to SMARA Section 2773(a), CCR Sections 3503(a)(1),(f),(g), 3704(c), 3705(a),(b),(c),(d),(e),(f),(g),(h),(i),(j),(k),(l),(m), 3707(b),(d), 3711(a),(b),(c),(d),(e))

1. The reclamation plan provides a brief description of the vegetation in the project area and states that pre-construction baseline vegetation surveys will be conducted before construction to evaluate community characteristics and structure as a basis for revegetation. Baseline surveys are essential to determining adequate reclamation measures under SMARA and mitigation measures under CEQA. The Monitoring and Maintenance section in the reclamation plan includes specific performance goals based on "previous research." The "previous research" is not discussed or referenced in the reclamation plan. Without site specific information for the project area, it is not possible to determine if the proposed standards are appropriate for this site.

   SMARA Section 2773(a) requires that a site-specific revegetation plan be developed. We recommend that reclamation plan include a description of the vegetation with discussion of density, canopy closure, height, and composition, as well as, understory composition and stratification, that this information form the basis for site revegetation.

2. We recommend that revegetation test trials be established and used to assess effectiveness of various types of revegetation techniques. Abandoned extraction wells and access roads can be used as test plots. Annual reports should be provided to the permitting agencies. The test trails should consider the following items.

   a. Test a variety of plant propagation techniques using the dominant native plants found on site. Rooted cuttings, divisions, or seeds of plants from the project area would be adapted to the site-specific conditions in that area and would, therefore, have a greater likelihood of successful establishment. The

use of cuttings and outplants may be necessary in the case of plants with low viability seed or sterile seed, or plants requiring specialized pre-treatment. Transplantation or propagation of cacti and yucca from areas to be disturbed should also be addressed. If commercial seed is used, as is proposed in the reclamation plan, the seed source should be from the vicinity of the project. The final species list should consist of a mixture of native climax and early-successional species.

b. Assess native microbial symbionts. Tests should be undertaken to develop methods for introducing and conserving soil microbial symbionts. Indigenous native species should also be tested on several different soil regimes, including those incorporating native soil at the root zone.

c. Alternate seed application techniques. Tests of seeding methods other than broadcast seeding are recommended because seeds left on the soil surface may be subject to desiccation and predation by rodents.

d. Species interactions. The revegetation tests should also assess species interactions for example, nurse plant effects, the results of growing nitrogen-fixing species with other species, and allelopathy.

e. Weed management. The reclamation plan does not discuss the control or eradication of weeds if they become established prior to, or during, revegetation.

f. Plant protection measures. If plant protection measures are anticipated, they should be discussed in the revegetation plan and tested prior to final installation.

3. Conservation and reapplication of topsoil is not addressed in the reclamation plan, although reference is made to stockpiling soils under Section 2.2.4. We recommend that the reclamation plan discuss how topsoil will be stockpiled and how it will be protected from wind or water erosion. For example, topsoil berms can be established along the access roads. These berms can be seeded with native colonizing species. These species may also establish naturally. When the roads are abandoned, they can be decompacted and the topsoil can then be pulled back over the roadbed.

The length of time the stockpiles are stored is critical. For example, soil microorganisms, especially mycorrhizal fungi, remain viable for a maximum of two or three years. Seeding with native species may conserve some of the soil fungi until the soil is reapplied. If reclamation does not

commence until ultimate mine closure, however, the soil may essentially be sterile.

4. The reclamation plan states that use of soil amendments, mulches, or tackifiers is not anticipated. We recommend that the plan present specific criteria for the conservation and reapplication of topsoil. The decision to use soil amendments or mulches should be based upon results from test plots and analyses of the growth medium. If topsoil is not conserved, amended subsurface layers may need to be treated in order to support vegetation.

If you have any questions on these comments or require any assistance with other mine reclamation issues, please contact James S. Pompy (916) 323-8565.

Stephen E. Oliva
Acting Environmental Program Coordinator

Attachments

⑧

COUNTY OF
ORANGE

ENVIRONMENTAL MANAGEMENT AGENCY
PLANNING

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DIRECTOR, EM

THOMAS B. MATHEW
DIRECTOR OF PLANNIN

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JUN 1993
BY

JUN 16 1993

NCL 93-58

Raymond Johnson
County of San Bernardino
Planning Department
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

SUBJECT: Draft EIR/EIS for the Fort Cady Minerals Corporation Solution Mining Project

Dear Mr. Johnson:

① Thank you for the opportunity to respond to the above referenced item. The County of Orange has no comment at this time. However, we would appreciate being informed of any further developments.

If you have any questions or need to contact us, please call Kari Rigoni at (714) 834-2109.

Very truly yours,

Kari A. Rigoni

Kari A. Rigoni, Sr. Planner

FOR: Robert V. White, Manager
Environmental Planning Division

CH:tk(ldnc)
3061513182663

⑨

U.S. Department of Transportation

Office of the Secretary
of Transportation

400 Seventh St., S.W.
Washington, D.C. 20590

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BY

JUL 14 1993

County of San Bernardino
Planning Department
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182
Attn: Mr. Raymond Johnson

Dear Mr. Johnson:

① This office has reviewed the Bureau of Land Management/County of San Bernardino draft environmental impact statement (EIS) for the Ft. Cady Minerals Solution Mining Project. We have no comments.

We appreciate the opportunity to review this draft EIS.

Sincerely,

Eugene L. Lehr

Eugene L. Lehr
Chief, Environmental Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUL 1993
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July 27, 1993

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	# of pages ▸ 4
To Edy Seehafer	From Ray Johnson
Co.	Co. S.B.Co. Planning
Dept.	Phone # (909) 387-4099
Fax # (909) 276-6109	Fax # (909) 387-3223

Ms. Edy Seehafer
Bureau of Land Management
150 Coolwater Lane
Barstow, CA 92311-3221

Dear Ms. Seehafer:

The U.S. Environmental Protection Agency (USEPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the **Fort Cady Minerals Corporation Solution Mining Project, San Bernardino County, California.** Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Policy's NEPA Implementation Regulations (40 CFR 1500-1508), and our authorities under §309 of the Clean Air Act.

The proposed action consists of construction and operation of a boric acid production in-situ mining and processing facility on 343 acres of public and private lands. The project includes a 273-acre ore body well field, a 10-acre processing facility, a 16-acres gypsum deposition area, and 43.5 acres of ancillary services.

We have rated this DEIS as EC-2 -- Environmental Concerns - Insufficient Information (see enclosed "Summary of Rating Definitions and Follow-Up Action"). Our rating reflects our concerns regarding the proposed project's potential impacts to surface water and groundwater resources and the need for additional information in the FEIS regarding potential impacts to water resources, measures to mitigate these impacts, and federal Underground Injection Control requirements as mandated by the Safe Drinking Water Act.

We appreciate the opportunity to review this DEIS. Please send two copies of the FEIS to this office when it is officially

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filed with our Washington, D.C., office. If you have any questions, please call Jeanne Dunn Geselbracht of my staff at (415) 744-1576.

Sincerely,

for JW

Jacqueline Wyland, Chief
Office of Federal Activities

enclosures

cc: Randy Scott, San Bernardino County Planning Department

Groundwater Issues

The proposed project involves the injection and extraction of fluids for the purpose of mineral production. Under the Federal Safe Drinking Water Act's Underground Injection Control program, an injection well used for extracting minerals in solution is a ① Class III well (40 CFR 144.6). The FEIS should discuss the requirements of the Underground Injection Control program for Class III wells (permitting, construction, and operation).

Please note that the State of California has not been delegated the Underground Injection Control program for Class I, III, IV, and V wells. Therefore, the USEPA will be responsible for the permitting and enforcement associated with the Fort Cady project Class III wells. For further information regarding permitting requirements, please contact Mr. Clancy Tenley, Chief of the USEPA Region 9 Groundwater Pollution Control Section.

According to the DEIS, the Pisgah fault separates areas of distinctly different groundwater quality. To the east of the fault, the concentrations of total dissolved solids (TDS) in groundwater are greater than 20,000 mg/l. The TDS concentrations in groundwater west of the fault range from 1,000 to 2,000 mg/l. ② The DEIS erroneously states that water with a concentration of 1,000 mg/l TDS is unusable for drinking water. However, water of this quality can be used for domestic purposes, and should be appropriately protected. ③ While the threat of degradation may be reduced by locating injection and production facilities on the eastern side of the fault, any expansion or relocation of operations to the western side of the fault would potentially affect Underground Sources of Drinking Water. Within this framework, you should be aware that federal Underground Injection Control regulations require protection of Underground Sources of Drinking Water up to 10,000 mg/l TDS.

④ Table 1.5-1 should include Class III injection wells and applicable Underground Injection Control program requirements.

⑤ According to the DEIS, drawdown of the aquifer would occur locally, and the estimated safe yield of the aquifer may be exceeded. This would be a significant, adverse and unmitigated impact (p. 4-17). The FEIS should provide more detailed information regarding aquifer drawdown. What is the safe yield, and by how much would it be exceeded? What would the parameters of the cone of depression be? How long would recharge/recovery take? What would the surface manifestations of such a drawdown be (e.g., any impacts to springs or seeps or phreatophytic

⑥ vegetation)? The FEIS should also discuss means to mitigate such impacts.

Surface Water

⑦ It appears from the DEIS that the proposed project may affect waters of the U.S. by modification of surface drainage patterns (pp. 4-19, 4-57/58). The FEIS should identify any waters of the U.S., as well as springs and seeps, on the project site that could be affected by the proposed project. ⑧ The FEIS should also describe any proposed modification of drainages and discuss whether the project would require a §404 permit under the Clean Water Act. Section 404 regulates the discharge of dredge or fill material into waters of the U.S., including wetlands and other "special aquatic sites." If a permit is required, EPA will review the project for compliance with the *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230), promulgated pursuant to §404(b)(1) of the Clean Water Act.

⑨ According to the DEIS, any modifications to surface drainages would be engineered to mitigate flooding and erosion hazards. The FEIS should describe the potential hazards and how they would be mitigated.

Land Management

It is unclear whether the proposed project would be consistent with management plans for the Research Natural Area and proposed Area of Critical Environmental Concern in the project vicinity. ⑩ The FEIS should discuss how the project would affect the particular resources of concern in these special management areas and identify the specific mitigation measures that would be implemented to maintain consistency with land management direction for these areas.

⑪ The DEIS states that there are no wilderness study areas associated with the pending Congressional legislation in close proximity to the site. However, it appears that the site is located near the Cady Mountains Wilderness Study Area (WSA), which is included in current versions of the pending California Desert Protection Act. The FEIS should discuss potential impacts that the proposed project would have on the WSA.

NEWBERRY SPRINGS
HARVARD PROPERTY OWNERS ASSOCIATION
P.O. Box 176, Newberry Springs, CA 92365

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July 28, 1993

Mr. Randy Scott, Planner
County Planning Department
385 N. Arrowhead Avenue, 3rd Floor
San Bernardino, CA. 92415-0182

RE: FORT CADY MINERALS CORPORATION
SOLUTION MINING PROJECT DRAFT.

Dear Mr. Scott:

① After having reviewed the Fort Cady Minerals Corporation Solution Mining Project Draft EIS/EIR, we strongly support approval of this project. We are satisfied with its environmental sensitivity. In addition, the 79 jobs and $3.5 million payroll that it will provide to this community, and surrounding areas, will take many people off the unemployment and welfare rolls, and put them on the tax rolls.

In our view the Draft EIS/EIR demonstrates that there would be no serious unmitigated environmental effect from this project. The tortoise habitat impact is being mitigated to the satisfaction of the Bureau of Land Management. And we can easily abide 161 acre feet of annual water consumptive use in return for such a large economic benefit to the community. We also, agree that the project will have no significant effect on the local school district, or fire and police services.

We are concerned that this project could be hindered or disapproved for its proximity to the Pisgah lava flow, which is being proposed as an Area of Critical Environmental Concern. We would like to point out that there are numerous lava flows in and around Newberry Springs, and other parts of the East Mojave Desert. We should also like to point out that the California Desert Conservation Area Plan (1980), May No. 17, does not list the Pisgah Lava Flow as an Area of Critical Environmental Concern, and that it was given a lesser status in that document.

Our organization has a long and strong record on environmental issues in and around Newberry Springs. In the early 1980's we went to the Court of Appeal to resist the siting of dairies and concomitant water intensive alflafa, to protect our already overdrafted water basins. In 1991, for reasons of environmental concern, we retained counsel in an attempt to convince the county to submit their closure of the local landfill to the California Environmental Quality Act review process.

For the past fifteen years or so we have vigorously lobbied the Mojave Water Agency to implement a regional water management plan, which they are now inthe process of adopting.

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To Edy Seahaefer	From Ray Johnson
Co.	Co. S.B. Co. Planning
Dept.	Phone # (909) 387-4099
Fax # (909) 276-6109	Fax # (909) 387-3223

In summation, we have carefully followed and reviewed this project proposal. We support the project "as is", without hesitation. Therefore, we would appreciate anything thatthe County or the Bureau of Land Management can do to facilitate or expedite the approval of the Fort Cady Minerals Corporation Solution Mining Project.

We thank you for your consideration.

Respectfully,

Hildamae Voght.

Hildamae Voght, Executive Director

cc: The Honorable Marsha Turoci
Mr Henri Bisson, BLM District Manager
Edy Seehafor, BLM
Merrill McCarty, Editor, Desert Dispatch

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To Edy Seahaefer	From Ray Johnson
Co.	Co. S.B. Co. Planning
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STATE OF CALIFORNIA—THE RESOURCES AGENCY

DEPARTMENT OF FISH AND GAME
330 GOLDEN SHORE, SUITE 50
LONG BEACH, CA 90802
(310) 590-5113

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BUREAU OF LAND MANAGEMENT
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BARSTOW RESOURCE AREA
BARSTOW, CALIFORNIA

July 21, 1993

Mr. Raymond Johnson
County of San Bernardino
Planning Department
385 North Arrowhead Avenue, Third Floor
San Bernardino, California 92415-0182

Dear Mr Johnson:

Draft Environmental Impact Study/Report (EIS/EIR) for the Fort Cady Minerals Solution Mining Project
San Bernardino County

The Department of Fish and Game (Department) has reviewed the above-referenced project, relative to impacts to biological resources. The following are our comments:

1. Section 3.5.2.1 - Sensitive Plants: The botanical surveys are incomplete, because they should also have addressed the Mohave monkeyflower, (*Mimulus mohavensis*), which is known to occur near the project area. This species is on the California Native Plant Society List 1b, and is considered to meet the California Environmental Quality Act (CEQA) Section 15380 definition of rare or endangered. ①

2. Section 4.1.5.1 - Construction Impacts to Botanical Resources: The Draft EIS/EIR analysis is inconsistent relative to project impacts and mitigation for rare plants. The Draft EIS/EIR indicates that both Crucifixion Thorn and Utah Cynanchum are in the project area, but exist only outside site areas proposed for development, and are not expected to be disturbed by construction (Page 4-29). This information is then contradicted on page 4-35, where it indicates sensitive plant species shall be transplanted to a suitable nearby habitat under the direction of a botanist. ②

   The Department considers Crucifixion Thorn to be an important species. The few populations known in this region represent the northernmost occurrences of the species, and are therefore important to the long term viability of this distinctive species. We consider

Crucifixion Thorn to be locally and regionally significant as described in CEQA, and therefore, impacts to this species, both during construction and over the life of the project, would be considered significant and should be fully mitigated. The species is also listed as sensitive by the Bureau of Land Management (BLM); the state BLM policy is that all sensitive species are afforded the full protection of the Endangered Species Act. Only three occurrences of Crucifixion Thorn are known within this area, and our information suggests that this may be a new occurrence. ②

The DEIS should analyze and show on maps the location of both rare plant populations relative to the project and site disturbance areas. These populations should be avoided and preserved. Additional suitable habitat to accommodate population fluctuations, substantial buffers (at least 250 feet from project activity areas), fencing and other appropriate measures are needed to ensure that they are protected over the life of the project. Preserve areas need to be connected to surrounding natural habitats and not isolated by large amounts of disturbed and modified habitat.

The Department does not support transplantation as a mitigation strategy for rare plants. Department studies have shown that transplantation is rarely successful. We are not aware of any information suggesting that transplantation of Crucifixion Thorn and Utah Cynanchum would be successful.

③ Should avoidance and preservation of Crucifixion Thorn as we have described not be feasible, then the project proponents may be required to compensate through acquisition of currently unprotected populations on private lands. Occupied, compensation habitat should be acquired through deed or easement and transferred to the Department or our designated agent. Appropriate ratios would depend upon the number of individuals and area impacted by the project and the habitat quality and value of compensation sites. A replacement ratio of at least 2:1, relative to plant density, seems appropriate. Also, compensation lands need to include additional suitable habitat and buffers as described previously. An endowment of approximately $300 per acre, plus the installation of fencing, should be required.

3. ④ Table ES 5-1: The summary of mitigation measures for plants does not include the mitigation measures as described in the body of the document, and should be modified to include the mitigation measures we have identified in this letter, based upon further analysis of project impacts to sensitive plants.

4. ⑤ Page ES-11, Table ES 5-1 - Wildlife: There is reference on this page to 1,480 acres of off-site desert tortoise habitat lands being transferred to the BLM to compensate for unmitigated desert tortoise impacts. Pages 4-41 and 4-42 discuss 341 acres being acquired and transferred. This seeming discrepancy needs to be explained or resolved. Furthermore, the Department does not necessarily agree that all of the compensation land should be deeded to BLM and believes the issue should be open to negotiation.

5. ⑥ Page 1-10, Table 1.5-1: This Table is a list of permits and approvals needed by the project. In the list of State of California permits and approvals there is no mention of a 2081 Management Agreement. Both of these are issued by the Department and are needed for this project.

Thank you for this opportunity to comment. Questions regarding this letter should be directed to Ms. Mary Meyer, Plant Ecologist, at (805)640-8019 or Mr. Frank Hoover, Associate Fishery Biologist, at (909)597-8235.

Sincerely,

Dwayne C. Maxwell

Fred Worthley for
Regional Manager
Region 5

cc: See attachement

Ms. Mary Meyer
Plant Ecologist
Ojai, California

Mr. Frank Hoover
Associate Fishery Biologist
Chino, California

Mr. Andy Pauli
Wildlife Biologist
San Bernardino, California

Ms. Rebecca Jones
Environmental Specialist
Palmdale, California

Ms. Constance Rutherford
U.S.Fish and Wildlife Service
Ventura, California

Ms. Debbie Clark
Bureau of Land Management
Barstow, California

Mojave
Water
Agency

August 2, 1993

Mr. Raymond Johnson
San Bernardino County
Planning Department
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0180

Dear Mr. Johnson:

The Mojave Water Agency received the Draft EIR/EIS for the Fort Cady Minerals Corporation Solution Mining Project on July 12 ,1993 following a request by staff. The Draft EIR/EIS was sent out for comments on June 4, 1993, therefore we received it 38 days after the initial transmittal. The Agency also did not receive the Notice of Preparation for review and comment. The Agency requests that future transmittals for projects which may affect the Mojave Water Agency be transmitted so that staff has sufficient time to review and formulate comments.

Thank you for the opportunity to comment. If you have any questions please contact me at (619) 240-9201.

Sincerely,

Norman T. Caouette
Director of Planning
and Resource Development

vlw

22450 Headquarters • P.O. Box 1089 • Apple Valley, CA 92307 • (619) 240-9201 • FAX (619) 240-2642

George R. Parker
Division # 1
Elayne Joy Gaines
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Bill A. Christopher
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Anita M. Hahs
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Thomas H. Irwin
Division # 5
Beverly J. Lowry
Division # 6
John H. Russell
Division # 7
Larry W. Rowe, P.E.
General Manager/Chief Engineer

Mojave
Water
Agency

August 2, 1993

Mr. Raymond Johnson
San Bernardino County
Planning Department
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0180

Re: Draft EIR/EIS for the Fort Cady Minerals Corporation Solution Mining Project

Dear Mr. Johnson:

Thank you for the opportunity to comment on the referenced project. As illustrated on the maps provided, the major portion of the project is located out of the Mojave Water Agency's (MWA) jurisdictional boundaries, however the project lies within the Mojave River watershed and has the potential to impact areas within the MWA, specifically the Newberry Springs, or "Baja" subarea. The project also proposes to place water production facilities within the MWA boundaries for use at the project site. The MWA's main concerns regarding the construction and operation of a boric acid production mining and processing facility are as follows:

A. Potential to Increase Ground Water Overdraft in the "Baja" Subarea

B. Extraction and Export of Ground Water out of MWA's Boundaries

C. Contamination of Ground Water Due to Erosion and Project Operations

① The Draft EIR/EIS has determined the total water consumption needed for operations is 161 acre feet per year. The consumptive use of 161 acre feet of water each year has been determined to be a significant environmental impact that is not mitigatible. It is the Agency's position that the impact must be mitigated. The proposed project will increase conditions of ground water overdraft from an aquifer with the largest overdraft

22450 Headquarters • P.O. Box 1089 • Apple Valley, CA 92307 • (619) 240-9201 • FAX (619) 240-2642

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Larry W. Rowe, P.E.
General Manager/Chief Engineer

① relative to natural supply in the Mojave River System. Due to the overdraft of the Mojave River System, an adjudication of water rights has been initiated. The Adjudication is ongoing, and the outcome is uncertain at this time. The water used for project operations would be extracted from the lower Mojave River Basin (also known as the "Baja" subarea) which covers approximately 680 square miles. The Regional Water Management Plan developed for the MWA has estimated the annual overdraft in the "Baja" subarea to be 28,500 acre feet at the end of 1990. The Newberry Springs area would consist of that portion of the "Baja" subarea downstream of the Calico-Newberry Fault. Impacts from over-production of the water supply and alteration of surface water drainage patterns have the potential to affect wells in the Newberry Springs area. These impacts could include but are not limited to, draw down of current water well levels, increases of TDS (salts, calcium carbonate, etc.) concentrations, and migration of mining process solutions resulting in degradation of ground water quality, etc.

② Concerning the extraction and export of ground water, Figure 1.2-2C identifies the location of proposed water wells and lines that will be constructed to supply water for project operations. The small portion of the project which is located within the MWA boundary has an identified proposed water well. The well in question is located in Township 8N Range 4E Section 24 in the NW1/4 of the NW1/4. It is the Agency's policy that there be no net loss of water through exportation from the MWA boundary. ③ Export of water from currently overdrafted ground water basins is one of the concerns addressed by the drafters of the proposed stipulated judgment, which attempts to find a physical solution to the overdraft of the Mojave River watershed.

④ Contamination of surface and ground water is a major concern of the Agency's. Contamination can result from erosion as well as from point sources. Drainage pattern alterations, although expected to be minimal, will cause sedimentation of surface streams within the Mojave River watershed. Sedimentation and degradation of stream channels will decrease the streams ability to recharge the ground water system as well as degrade water quality and increase flooding downstream. Construction and reclamation activity will cause erosion and sedimentation as well. Ground water Quality mitigation contained on page 4-19 states that "monitoring wells would be installed downgradient to evaluate any changes that may result from migration of mining solutions." The mining process will produce solution that will contain high ⑤ concentrations of water soluble salts. The MWA recommends that a project wide monitoring well network be developed to determine to a greater extent than outlined in the EIR/EIS the hydro-geology and subsurface flow of the project area. A full understanding of ground water movement and its quality is necessary in order to detect point sources of contamination such as mining process solutions and/or other by-

products associated with the project operations.

⑥ Due to the nature of the operations proposed there is the possibility of subsidence. In the vicinity of the project, subsidence may occur from overproducing the ground water basin (which is already is a state of overdraft), subsurface mining and tectonic downwarping, which is possible considering the number of faults transversing the project site. Although one of these factors may not cause subsidence the cumulative impact of all three may. This concerns the Agency because if subsidence occurs a portion of the aquifer could be destroyed which would impact the natural recharge of the "Baja" subarea. The MWA suggests that the possibility of subsidence be investigated further to determine the cumulative impacts from all factors.

In summary, it is the Agency's position that the project has the potential to significantly impact the already overdrafted ground water basin within the area, through additional production, potential subsidence, and contamination. The current draft EIR/EIS does not adequately address these issues and the project should not be approved until they have been adequately addressed and mitigated. At minimum, the draft EIR/EIS should fully describe the well monitoring network plan proposed as mitigation to assess ground water quality problems due to operations, and require installation prior to commencement of operation. The monitoring program should meet the requirements of the Lahontan Regional Water Quality Control Board. Means to offset the increase in the overdraft of the "Baja" subarea should also be identified.

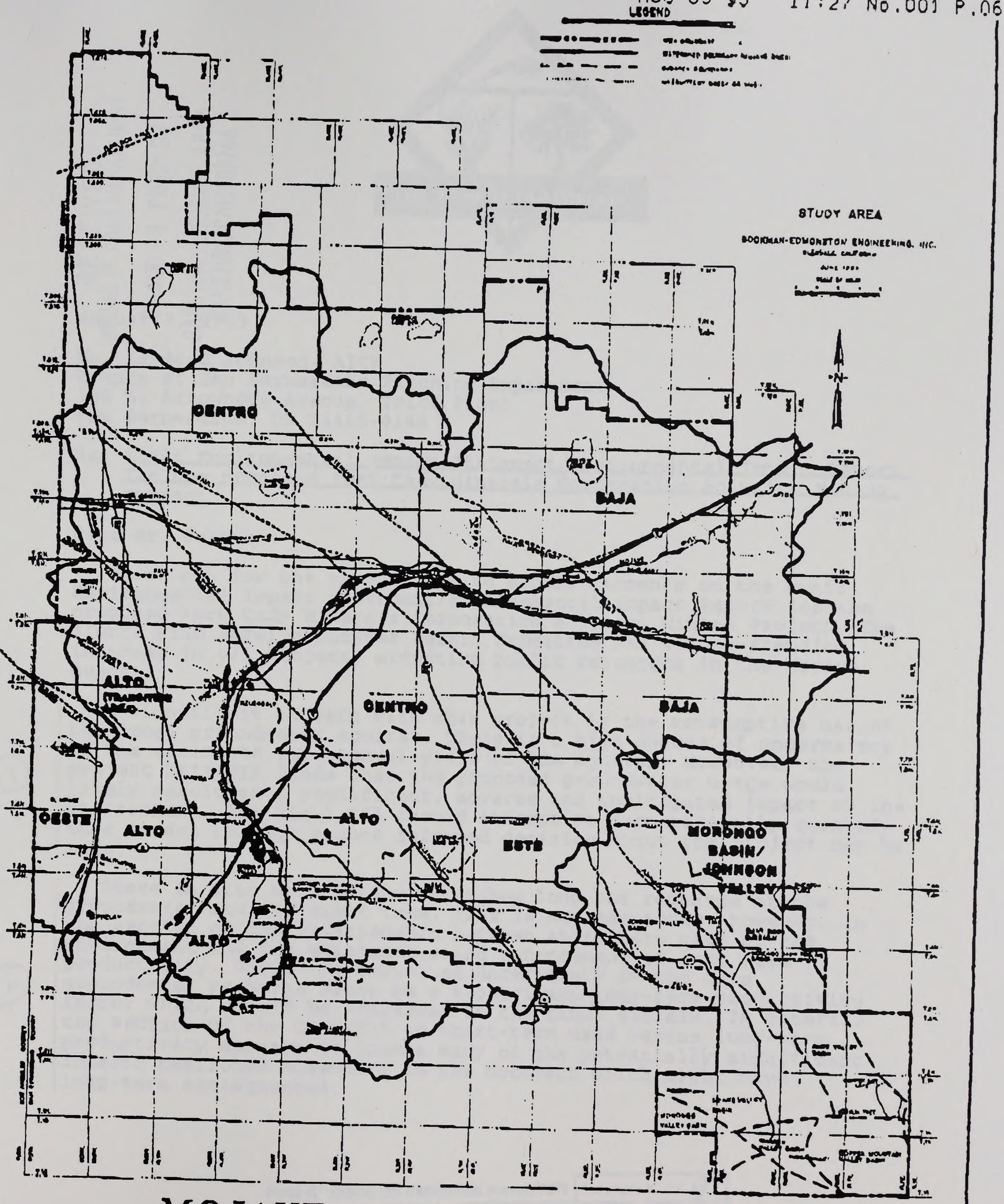
Again thank you for the opportunity to comment. If you have any further questions please contact me or Valerie Wiegenstein at (619) 240-9201.

Sincerely,

Norman T. Caouette
Director of Planning
and Resource Development

cc: Planning and Resource
Development Committee

Attachment
vlw



MOJAVE WATER AGENCY

REGIONAL WATER MANAGEMENT PLAN

FIGURE 2

THE DESERT COMMITTEE

RECEIVED
BUREAU OF LAND MANAGEMENT
93 AUG -3 PM 12:37
BARSTOW RESOURCE AREA
BARSTOW, CALIFORNIA

August 2, 1993

Mr. Raymond Johnson, AICP
County of San Bernardino Planning Department
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

Re: Draft Environmental Impact Statement/Environmental Impact Report for the proposed Fort Cady Minerals Corporation Solution Mining Project

Dear Mr. Johnson:

Thank you for the opportunity to submit comments on the Draft Environmental Impact Statement/Environmental Impact Report for the proposed Fort Cady Minerals Corporation Solution Mining Project. The Sierra Club Angeles Chapter Desert Committee has a long-standing interest in all projects affecting public resources in the Mojave desert.

① A significant concern with this project is the consumptive use of the local groundwater aquifer. There is a high degree of uncertainty in the estimated safe annual yield of the aquifer. Moreover, the project DEIS/EIR finds that the proposed groundwater usage would likely result in a significant, adverse and unmitigated impact on the environment. The final EIR should attempt to more carefully quantify this impact so that a more informed decision about the project may be made.

② There is also uncertainty about how long the recharge of the groundwater aquifer might take. This is not mentioned, however, in the section on the relationship between short-term uses of the environment and the maintenance and enhancement of long term productivity. Given the amount of uncertainty in the data, groundwater recharge might be a significant long-term productivity factor which should be addressed in the final EIS/EIR. In general, the section of the DEIS/EIR on short-term uses versus long-term productivity appears to ignore many of the potentially significant impacts mentioned elsewhere in the document which might have long-term consequences.

Post-it™ brand fax transmittal memo 7671

# of pages ▸ 9	
To Edy Seehafer	From Ray Johnson
Co.	Co. S.B. Co. planning
Dept.	Phone # (909) 387-4099
Fax # (909) 276-6109	Fax # (909) 387-3223

③ Another significant groundwater concern is the potential for contamination of the aquifer by leaks of process chemicals in the event of an earthquake or accident at the plant. The potential for such spillage is given very little attention in the DEIS/EIR yet the volume of potential pollutants is very high. It seems likely that an accident might happen at some time during the estimated 130 year life of the project. What is the potential for contamination of the aquifer in the event of such a spill? What safety measures will be taken to prevent such a spill? What measures might be taken to clean up after such a spill and does the project proponent have the resources to perform such a clean-up? The final EIS/EIR should address these concerns.

④ Regarding Land Use and Recreation, the 75' height of the building proposed for the site is inconsistent with the County Rural Conservation Land Use District policy of heights no greater than 35'. The DEIS/EIR states that a variance will be applied for and is expected to be approved. Is this sound planning? Should not the project facility be redesigned to comply with the established land use policy? A similar conflict exists with respect to the Airport Hazard Overlay Zone situated over the site which might be similarly addressed by a redesign rather than a variance. Is the granting of a variance, which is not a certainty, a mitigation of a potential impact as stated in the DEIS/EIR? Logic would indicate to the contrary. This should be addressed in the final EIR.

⑤ There is a potential conflict between the project and the proposed ACEC designation for the Pisgah Crater, an impact which is deemed to be potentially significant. Yet there is little discussion of mitigation measures other than "consultation with the BLM and affected parties to refine potential impacts and mitigation requirements." This consultation and refinement should take place during the writing of the EIS/EIR and be included for public review and comment rather than at some later unspecified date. What are the potential conflicts and how can they be mitigated?

⑥ The DEIS/EIR states that cumulative impacts to Land Use and Recreation may be significant and not all of them may be mitigated. Again, what are the potential cumulative impacts and what mitigation is proposed? This should also be addressed in the final EIS/EIR.

The DEIS/EIR correctly identifies the No Action Alternative as the environmentally superior alternative (p. ES-4). In the same Executive Summary the document states that economic benefits to the project include "some reduction in the dependence of American manufacturers on foreign imports of boric acid and the potential to increase foreign export of boric acid" and the "potential reduction of consumer costs for certain industrial products, and the opportunity to establish a track record of the in-situ mining process" for boric acid. ⑦ Presumably this statement is intended as an offset or balance to the environmental impact of the project. What data are used to support this statement? Will the final EIR/EIS cite an authority who can support this conclusion?

The Sierra Club Angeles Chapter Desert Committee appreciates the opportunity to comment on this project. Please send us a copy of the final EIS/EIR and keep us informed about this issue.

Very truly yours,

James S. Schoedler
Chair,
Sierra Club Angeles Chapter Desert Committee
3445 Wilshire Blvd, Suite 508
Los Angeles, CA 90010

STATE OF CALIFORNIA PETE WILSON, *Governor*

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION
VICTORVILLE BRANCH OFFICE
15428 CIVIC DRIVE, SUITE 100
VICTORVILLE, CA 92392-2359
(619) 241-6583
FAX No. (619) 241-7308

August 20, 1993

Mr. Randy Scott
Planning Department
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, CA 92415-0180

Dear Mr. Scott:

REVIEW OF DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED FORT CADY MINERALS CORPORATION'S SOLUTION MINING PROJECT, SAN BERNARDINO COUNTY

Regional Board staff reviewed the subject Draft Environmental Impact Report (DEIR) and has the following comments. Staff's comments fall under four separate categories which include Regulatory Requirements, Basin Plan Issues, Hydrology and Hydrogeology, and Other Issues.

REGULATORY REQUIREMENTS:

1. A waste characterization of gypsum was provided on page 2-12 of the DEIR. This characterization was established within the guidelines of the Resource Conservation and Recovery Act (RCRA) hazardous waste identifications criteria. As a result, gypsum was shown to be non-hazardous because it does not contain CAM metals. Based on this determination, and the fact that gypsum is a marketable product, the DEIR concludes that the gypsum storage area should not be regulated under Waste Discharge Requirements (WDRs) of the Regional Board.

① The project proponent should be aware that the exclusion of a waste or material from RCRA hazardous waste criteria does not necessarily constitute exemption from the Regional Board's WDRs. Water Code (Section 13050.q) defines mining waste as "all solid, semisolid, and liquid waste materials from the extraction, beneficiation, and processing of ores and minerals". The Regional Board is responsible for issuing WDRs for mining waste to ensure prevention of pollution or contamination of the waters of the state where needed (Section 1263.1).

Although gypsum is a marketable mining product, in this case it is regarded as waste under the Water Code, and its storage will be subject to WDRs prescribed under the regulations of Chapter 15, Title 23, California Code of Regulations (Chapter 15).

Chapter 15 is made up of ten articles which set forth relevant definitions and requirements for the control and management of Discharges of Waste to Land. Article 7 specifically addresses requirements for the management of mining waste and waste management units and their closure and post closure maintenance.

① The project proponent will need to file a Report of Waste Discharge (RWD). The RWD will need to include a complete Form 200 and appropriate information relevant to a complete waste characterization of any mining wastes produced by the proposed solution mining, including gypsum; any waste management units to be installed within the facility; and details of the injection well operations.

Regional Board staff will evaluate this submittal within the prescriptive guidelines and classification standards of Article 7 of Chapter 15. The proposed gypsum storage area is most likely to be classified as a Group B or Group C mining waste management unit, and WDRs will be prescribed by the Regional Board accordingly. The RWD must provide adequate information to allow Board staff to determine that the applicable criteria and requirements contained in the Chapter 15 regulations are met.

2. The project proponent does not address permitting requirements for solution mining described in Section 1.5 of the DEIR (Page 1-9 and Table 1.5-1). It is the Regional Board staff's position that the proposed injection wells are classified as Class III injection wells and are subject to permitting by the U.S. Environmental Protection Agency (EPA) as described under Section 144.25, 40 CFR (Code of Federal Regulations). ② For more detailed information on this requirement and essential procedures for permitting, the project proponent is advised to contact Mr. Mark Ripperda of EPA, Region 9, at (415)-744-1836.

Furthermore, the Regional Board may find it necessary to issue WDRs on the injection well operations as authorized under Section 13267(d) of the California Water Code. This will depend on a determination by Regional Board staff as to whether the injection well system could affect the quality of waters of the state.

BASIN PLAN ISSUES:

The project area lies within the Troy Hydrologic Subunit. The South Lahontan Water Quality Control Plan (Basin Plan) designates the following beneficial uses for the subunit:

a. municipal supply
b. agricultural supply
c. industrial supply
d. freshwater supply

③ Any adverse impacts to the above beneficial uses or exceedence of the water quality objectives from the proposed project and associated injection operations should be fully addressed in the Final Environmental Impact Report (FEIR). This should include the potential impact of discharges of acid solutions, isooctonal, kerosene and any other materials which will be used in the mining operations.

The DEIR states in many sections that ground water within the project area is unusable due to high Total Dissolved Solid (TDS) content. TDS content has been shown to vary to a significant degree within the same hydrologic unit. If the project proponent proposes that certain beneficial uses of ground water are potentially impacted, this should be specifically demonstrated on a site specific basis with supporting information. In this case, a Regional Board resolution for an amendment to the Basin Plan will be required in accordance with the ability of the proponent to demonstrate that mining operations and waste management practices have no impact to the beneficial uses of ground water as a result of discharge of high TDS solutions.

HYDROLOGY AND HYDROGEOLOGY:

④ Considering that the proposed project involves very complicated injection operations in a hydrologically and hydrogeologically intricate basin, the DEIR does not provide sufficient information on hydrogeology. In fact, a solid resolution of the direction of ground water flow has not been achieved. Also, permeability and hydraulic conductivity measurements are not extensively carried out to delineate the aquifer characteristics of the formations within the project area.

A mining operation based on injection of acid solutions and other environmentally significant chemicals requires thorough understanding of the hydrogeology of the project area. In order to obtain such an understanding and operate a comprehensive monitoring system, the project proponent must extensively investigate the hydrology and hydrogeology of the project area. As stated in page 3-25, there is very limited ground water elevation data available and information regarding permeability of the formations is limited. Furthermore, the DEIR presents an assumption that the mudstone formation enclosing the ore body is highly impermeable, and escape of acid solutions from the formation is not likely. Mitigation of potential impacts to ground water must be based on either solid evidence or a well established monitoring program rather than relying on assumptions made on the permeability of the enclosing formation. The DEIR does not address any monitoring issues and does not provide sound hyrogeologic information. A detailed plan for future investigations and a preliminary monitoring plan should be incorporated into the FEIR.

⑤ The major potential impact to ground water from this project is stated to be overdraft of ground water by approximately 161 acre-feet per year. The project proponent must address water quality issues related to this overdrafting.

OTHER ISSUES:

⑥ The DEIR does not outline the details of closure and post closure of the project facility. Only surface features are considered in the closure of different parts of the site. In fact, no statement on the closure of the underground injection operation has been provided. Closure and post closure of the different units of the facility should be provided in accordance with applicable regulatory requirements in the FEIR. Furthermore, the methods involved in the neutralization of the ore and enclosing formation water should be explained in detail.

Please send us a copy of the FEIR when it becomes available. Regional Board staff appreciates the cooperation in protection of water quality. If you have any questions regarding the staff's comments, please contact Kim Cebecioglu or me at the Victorville office.

Sincerely,

Ken Carter

Ken Carter
Senior Engineer

rp9/scott.kim/cd

cc: Leslie W. Senger
Valeria Wiegenstein, Mojave Water Agency

Mojave Desert
Air Quality Management District

MDAQMD

15428 Civic Drive, Suite 200, Victorville, CA 92392-2383
(619) 245-1661 Fax No. (619) 245-2699

Charles L. Fryxell
Air Pollution Control Officer

August 2, 1993

Randy Scott
County of San Bernardino
Planning Department
385 N. Arrowhead Ave., 3rd Floor
San Bernardino, CA 92415-0182

Re: Comments on the Draft Environmental Impact Report for the Fort Cady Minerals Solution Mining Project

Dear Mr. Scott,

The Mojave Desert Air Quality Management District (MDAQMD) appreciates the opportunity to provide the following comments regarding the above-referenced proposed project. MDAQMD is responsible for adopting and implementing air quality regulations for the San Bernardino County portion of the Southeast Desert Air Basin (District), as mandated by the federal Clean Air Act Amendments of 1990 (CAAA), and the California Clean Air Act of 1988 (CCAA). Pursuant to the California Environmental Quality Act (CEQA), Article 7, Section 15096 (d), MDAQMD reviews and analyzes projects that may generate significant adverse air quality impacts. MDAQMD then advises the Lead Agency on air quality issues that may affect the MDAQMD's efforts in attaining required State and National Ambient Air Quality Standards in the District.

① MDAQMD staff has reviewed the Draft Environmental Impact Report (EIR), and affirms that our concerns regarding adverse impacts on air quality have been met with the prescribed mitigation measures. To ensure that these measures will be appropriately implemented, MDAQMD will appreciate the opportunity to review the mitigation implementation plan.

MDAQMD appreciates the opportunity to comment on the Development Proposal for the project and looks forward to continued participation in the environmental review process. If you have any question regarding these comments, please contact me at (619) 245-1661.

Sincerely,

CHRISTIAN IHENACHO
Supervising Air Quality Planner
Planning and Technical Services

cc: Kayode P. Kadara

IN RE: FORT CADY MINERALS POST BORATE MINE

REPORTER'S TRANSCRIPT OF PROCEEDINGS

LOCATION: NEWBERRY SPRINGS COMMUNITY CENTER
30884 NEWBERRY ROAD
NEWBERRY SPRINGS, CA 92365

DATE AND TIME: TUESDAY, JUNE 29, 1993
7:10 P.M. - 7:30 P.M.

REPORTED BY:

SANDRA L. HOPPER, C.S.R.

(NO. 7110)

JOB NO. 22978SH

APPEARANCES

SPEAKERS:

EDY SEEHAFER
GEORGE HARTMAN
ANDREW RUSH
HILDA MAE VOGHT

NEWBERRY SPRINGS, CA TUESDAY, JUNE 29, 1993

PROCEEDINGS

MS. SEEHAFER: GOOD EVENING, EVERYBODY. WELCOME TO THE FIRST OF TWO PUBLIC MEETINGS ON THE FORT CADY MINERALS POST BORATE MINE. MY NAME IS EDY SEEHAFER, AND I'M THE ENVIRONMENTAL COORDINATOR FOR THE BARSTOW RESOURCE AREA, BUREAU OF LAND MANAGEMENT. AND I'M GOING TO BE FACILITATING THIS MEETING. ALSO HERE FOR THE BARSTOW RESOURCE AREA IS KEN SCHULTE OF THE MINERALS PROGRAM.

THE PURPOSE OF THIS MEETING IS TO RECEIVE YOUR COMMENTS ON THE ADEQUACY OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND ENVIRONMENTAL IMPACT REPORT WHICH THE BUREAU OF LAND MANAGEMENT IN CONJUNCTION WITH THE COUNTY OF SAN BERNARDINO HAVE PREPARED SOME EXTRA COPIES OF THE DRAFT E.I.S./E.I.R. OVER ON THE DESK HERE. SO IF YOU HAVEN'T YET RECEIVED A COPY AND WOULD LIKE TO HAVE ONE, YOU CAN TAKE ONE OUT OF THE BOX.

THIS IS MY FIRST PUBLIC MEETING, SO EXCUSE ME IF I'M A LITTLE NERVOUS UP HERE. I'M GOING TO FIRST INTRODUCE THE PROJECT FROM THE

B.L.M.'S POINT OF VIEW, AND THEN WE'LL HAVE THE COUNTY -- IS ANDREW RUSH HERE YET? I HAVEN'T MET ANDREW YET, SO -- NO, ANDREW ISN'T HERE. IF ANDREW DOESN'T COME, I WILL INTRODUCE THE COUNTY'S ROLE. AND THEN GEORGE HARTMAN FROM FORT CADY MINERALS IS GOING TO TALK A LITTLE BIT ABOUT THE PROJECT ITSELF.

THE JOINT DRAFT E.I.S./E.I.R. HAS BEEN PREPARED UNDER THE REQUIREMENTS OF BOTH THE NATIONAL ENVIRONMENTAL POLICY ACT AND THE CALIFORNIA ENVIRONMENTAL QUALITY ACT. THE PURPOSE OF THE DOCUMENT IS TO ANALYZE THE PROBABLE ENVIRONMENTAL IMPACT PROPOSAL. THE PROJECT AREA INCLUDES BOTH PUBLIC AND PRIVATE LANDS; HOWEVER, THE COUNTY AND B.L.M. ACT INDEPENDENTLY IN THEIR OWN CAPACITIES AND JURISDICTIONS.

AFTER THE INTRODUCTION OF THE PROJECT IS COMPLETE, EVERYONE WISHING TO MAKE COMMENTS ON THE DRAFT E.I.S./E.I.R. WILL BE HEARD. OUR OFFICIAL COURT REPORTER -- AND WHAT IS YOUR NAME?

THE REPORTER: SANDY HOPPER.

MS. SEEHAFER: -- SANDY HOPPER WILL BE TAKING DOWN EVERYTHING WE SAY IN ORDER TO RECORD ACCURATELY EVERYONE'S ORAL COMMENTS. IN ORDER THAT SHE CAN COMPLETE HER TASK AND GET AN ACCURATE

RECORD, WE ASK THAT YOU REMAIN AS QUIET AS POSSIBLE DURING THE MEETING WHILE OTHER FOLKS ARE TALKING.

FIRST OFF I'LL BRIEFLY TALK ABOUT THE B.L.M.'S MANAGEMENT ROLE IN THE PROJECT. BASICALLY, OUR INVOLVEMENT WAS INITIATED WHEN FORT CADY MINERALS CORPORATION SUBMITTED A PLAN OF OPERATIONS TO THE B.L.M. FOR A BORATES MINING PROJECT. AND IT'S LOCATED APPROXIMATELY 17 MILES EAST OF NEWBERRY SPRINGS -- EAST OF HERE. AND IT INCLUDES UNPATENTED MINING CLAIMS ON PUBLIC LANDS.

THE B.L.M.'S ROLE IN THE PROCESS ARE THREEFOLD. FIRST, WE ARE RESPONSIBLE TO ENSURE THAT NO UNDUE AND UNNECESSARY DEGRADATION WOULD OCCUR. SECOND, THE B.L.M. DETERMINES APPROPRIATE MODIFICATIONS AND/OR CONDITIONS TO THE PLAN OF OPERATIONS AND RECLAMATION PLAN FOR PROTECTING RESOURCE VALUES. AND THIRD, THE B.L.M. IS RESPONSIBLE FOR PERMITTING RIGHT-OF-WAYS ACCESS ACROSS PUBLIC LANDS TO PROVIDE PROJECT ACCESS AND MEET PROJECT INFRASTRUCTURE NEEDS. WE ARE DOING THIS THROUGH THIS JOINT ENVIRONMENTAL IMPACT REPORT, ENVIRONMENTAL IMPACT STATEMENT.

AS TO THE COUNTY'S ROLE -- HAS ANDREW COME IN YET? OKAY.

BASICALLY, THE COUNTY'S ROLE IN THIS IS

THEY WILL BE LOOKING AT EVALUATING A CONDITIONAL USE PERMIT FOR FORT CADY'S PROPOSAL. THE COUNTY WILL ALSO COORDINATE OVERSIGHT OF THE PLAN OF OPERATIONS, RECLAMATION PLAN EVALUATION, AND APPROVAL FROM THEIR POINT OF VIEW. THE COUNTY WILL ALSO COORDINATE SOME ADDITIONAL DOWNSTREAM PERMITTING THAT THE FORT CADY MINERALS PROJECT WILL HAVE TO PURSUE IF THEY GO AHEAD AND APPROVE THEIR CONDITIONAL USE PERMIT.

OKAY. GEORGE CAN SPEAK BEST TO THE PROJECT ITSELF. SO I'M GOING TO HAVE GEORGE VERY BRIEFLY GET UP AND LET YOU KNOW WHAT THE FORT CADY BORATE MINERALS PROJECT IS.

MR. HARTMAN: THANK YOU, EDY.

FIRST OF ALL, I'D LIKE TO INTRODUCE LES SINGER. HE'S WITH DAMES & MOORE. HE'S HELPED PUT TOGETHER -- OR THEIR COMPANY DID PUT TOGETHER THE ENVIRONMENTAL IMPACT STATEMENT.

HI, ANDREW.

FIRST OF ALL, LES SINGER'S COMPANY, DAMES & MOORE, PUT TOGETHER THE E.I.S./E.I.R. AND IS AS A THIRD PARTY. AND I'LL JUST GO THROUGH A LITTLE BIT OF THE PROJECT DESCRIPTION JUST TO HAVE EVERYBODY HAVE AN UNDERSTANDING OF WHAT WE'RE GOING TO DO.

FORT CADY MINERALS CORPORATION IS A

WHOLLY OWNED SUBSIDIARY TO A COMPANY BY THE NAME OF DUNDEE BANCOR. AND IT'S HEADQUARTERED IN TORONTO, CANADA. AND IT HAS EXTENSIVE HOLDINGS. IT WAS A LARGE GOLD MINING CONCERN, BUT IT SOLD ITS ASSETS TO HOME-STAKE GOLD. IT'S THE LARGEST HOLDER OF HOME-STAKE GOLD STOCKS TODAY.

THE PROJECT ITSELF CAN BE DESCRIBED IN THIS -- IN THIS AERIAL PHOTOGRAPH. THE SAME AERIAL TYPE OF THING IS IN YOUR BOOKLET THERE ON FIGURE 12-2. IF YOU CAN SEE, THIS IS I-40 COMING THROUGH HERE. WE COME OFF OF PISGAH ROAD. WE GO OVER B.L.M. COUNTRY HERE WITH AN ACCESS ROAD. WE'RE ALSO BRINGING IN A RAILROAD TO THE PROCESSING PLANT. THIS IS OUR ORE BODY. THIS IS OUR PROCESSING PLANT. WE HAVE A GYPSUM STORAGE AREA HERE. THEN WE COLLECT OUR FRESH WATER TO THE PLANT ON THE SOUTH SIDE OF PISGAH FAULT HERE. THAT'S JUST A LITTLE OVERVIEW OF THE SITE ITSELF.

BASICALLY, THERE'S TWO PARTS TO THIS PROJECT. ONE IS THE MINING, AND TWO IS THE PROCESSING. THE MINING, OF COURSE, IS CONCERNED WITH THE ORE BODY. THE ORE BODY CONSISTS OF ABOUT 273 ACRES. AND THE ORE BODY IS POSITIONED APPROXIMATELY 1400 FEET BELOW THE SURFACE. IF YOU STOOD TO THE SOUTH OF IT AND LOOKED AT IT, THE ORE

BODY WOULD LOOK SOMETHING LIKE THAT. IF YOU STOOD ON THIS END AND LOOKED AT IT, IT WOULD LOOK LIKE THIS. THIS IS AN INNER VIEW; THIS IS A SIDE VIEW.

WHAT WE WILL DO IS WE WILL PUT WELLS INTO THE -- INTO THE ORE BODY. AND THESE WELLS WILL BE VERY SIMILAR TO THE WELLS THAT YOU USE OUT HERE ON YOUR PROPERTY TO OBTAIN DRINKING WATER; ALTHOUGH, A OF COUPLE DIFFERENCES: ONE, IT'S 1300 FEET DEEP AT LEAST, AND WE USE A FIBERGLASS CASING. THE REST OF IT WE USE THE SAME DRILLERS -- EAGLE DRILLING, WARREN WALLS, PEOPLE FROM THE LOCAL AREA TO INSTALL OUR WELLS HERE.

THE SECOND PART OF THE PROCESS -- THIS LOOKS PRETTY COMPLICATED, BUT IT'S NOT REALLY THAT COMPLICATED. WE'VE COME OUT OF THE WELL FIELD -- IN OTHER WORDS, THOSE WELLS THAT I WAS TALKING ABOUT. WE'VE COME TO A COOLING AREA WHERE IT COOLS THE SOLUTION. WE FILTER THE MATERIAL THAT HAS COOLED AND PRECIPITATED OUT. THEN WE COME INTO A SOLVENT EXTRACTION CIRCUIT. THE SOLVENT EXTRACTION IS A MINERAL PROCESS THAT THEY USE IN COPPER, URANIUM, NICKEL. IT'S WIDELY USED. THIS SOLVENT EXTRACTION CONCENTRATES THE METAL OF INTEREST. IN THIS CASE, WE HAVE THE BORIC ACID THAT WE'RE TRYING TO CONCENTRATE.

FROM THERE WE STRIP THE BORIC ACID OUT. WE COME INTO A CRYSTALLIZER WHICH WILL CAUSE THE BORIC ACID TO COME OUT A SOLUTION AND CRYSTALLIZE. THEN WE TOOK A CENTRIFUGE. THEN WE DRY IT. AND THEN IT GOES INTO THE PRODUCT STORAGE AREA AND THEN FINALLY TO MARKET, AND HOPEFULLY WE CAN -- WE GET A CHECK BACK. THAT'S THE WHOLE REASON FOR IT.

THE SOLUTION COMES OVER HERE TO THE REGENERATION AREA, AND WE ADD SULFURIC ACID AT THIS POINT. AND WHAT HAPPENS IS GYPSUM PRECIPITATES. GYPSUM IS A FINE, WHITE POWDER. IT'S THE SAME MATERIAL THAT YOU HAVE ON YOUR -- ON YOUR WALLBOARDS -- WHAT THEY MAKE WALLBOARD OUT OF. JUST LOOKS LIKE FLOUR. IT'S INERT, AND IT DOESN'T -- THERE'S NO DANGER TO IT AT ALL.

FROM THERE THE WATER GOES BACK, AND WE INJECT IT AGAIN INTO THE WELL FIELD. AT THIS POINT IT'S A LOW-CONCENTRATION ACID. IT'S ABOUT 5 PERCENT ACID AT THIS POINT -- NOT OVER 5 PERCENT, I SHOULD SAY. GOES INTO THE WELL FIELD AND BACK AROUND. AND IT JUST KEEPS ON TRUCKING.

GYPSUM IS FILTERED, AND WE PUT IT UP IN A GYPSUM HOLDING AREA. AND THEN WE SELL IT TO EITHER WALLBOARD PEOPLE OR TO THE CEMENT PEOPLE.

THAT CONCLUDES MY DESCRIPTION.

MS. SEEHAFER: THANK YOU, MR. HARTMAN.

OKAY. I SEE ANDREW IS HERE.

ANDREW, DID YOU WANT TO GET UP AND SAY A FEW WORDS ABOUT THE COUNTY'S ROLE IN THIS?

MR. RUSH: SURE.

MS. SEEHAFER: YOU CAN PROBABLY DO IT BETTER THAN I CAN.

MR. RUSH: I'LL TRY.

MY NAME IS ANDREW RUSH. I'M THE PROJECT PLANNER FOR THE COUNTY OF SAN BERNARDINO. THERE'S ALSO ANOTHER PLANNER, RAY JOHNSON. HE'S THE ENVIRONMENTAL COORDINATING PLANNER FOR THE PROJECT. TOGETHER WE HAVE BEEN REVIEWING THIS. I'VE BEEN WITH THE PROJECT SINCE ITS INCEPTION.

WE, BASICALLY, ARE TAKING THE E.I.R. PORTION -- THE ENVIRONMENTAL IMPACT REPORT PORTION OF THE PROJECT AND TAKING IT THROUGH THE PROCESS TO MAKE SURE THAT IT COMPLIES WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT. WE WILL BE PROCESSING A MINING RECLAMATION PLANT, A PORTION OF THE PROPERTY THAT ARE PATENTED MINING CLAIMS WHICH FALL UNDER THE JURISDICTION OF THE COUNTY. WE WILL ALSO BE PROCESSING AND APPROVING A RECLAMATION PLANT ACROSS THE ENTIRE SITE TO INCORPORATE BOTH PATENTED PROPERTY AND UNPATENTED MINING CLAIMS.

OUR PROCESS, ONCE THIS HAS GONE THROUGH THE DRAFT CIRCULATION PERIOD, WE WILL COMPLETE A FINAL. WE WILL CIRCULATE THE FINAL, AND THEN WE WILL SCHEDULE IT FOR A HEARING BEFORE OUR PLANNING COMMISSION DOWN IN SAN BERNARDINO. ALL MINING OPERATIONS HAVE TO HAVE A PUBLIC HEARING. AND AT THE PUBLIC HEARING, STAFF AT THAT POINT WILL HAVE A STAFF REPORT WITH ALL THE MITIGATION MEASURES AND CONDITIONS OF APPROVAL WRAPPED UP INTO A PACKAGE FOR THE PLANNING COMMISSION.

THERE WILL BE OTHER ADDITIONAL REPORTS OUTSIDE OF THE HEARING CHAMBERS. IF YOU DO COME, YOU'LL BE ABLE TO -- PROVIDED WITH A COPY OF THAT STAFF REPORT SO YOU HAVE AN IDEA WHAT THE CONDITIONS ARE.

BECAUSE IT IS -- THE PROJECT IS MOSTLY ON B.L.M., B.L.M. IS TAKING THE LEAD IN THIS PROJECT. SO WE ARE JUST MORE OF A RESPONSIBLE AGENCY. AND WE ARE ALSO TO ENSURE THAT IT COMPLIES WITH THE SURFACE MINING AND RECLAMATION ACT. AND SO WE'RE TAKING MORE OF A RESPONSIBLE STATUS ROLE.

AND IF YOU HAVE ANY QUESTIONS ON OUR PROCESS, I'LL HAVE CARDS AVAILABLE AFTER THE PRESENTATION. FEEL FREE TO CALL US AT ANY TIME. WE'LL BE HAPPY TO ANSWER ANY OF YOUR QUESTIONS.

MS. SEEHAFER: OKAY. THANK YOU, ANDREW.

OKAY. WHEN YOU CAME IN TONIGHT, AS I SAID EARLIER, THERE WERE SOME REGISTRATION CARDS OVER ON THE DESK. IF YOU HAVEN'T HAD A CHANCE TO PICK ONE OF THOSE UP AND YOU WOULD LIKE TO, GO AHEAD AND PICK ONE OF THOSE UP NOW. IF YOU DECIDE LATER IN THE EVENING YOU'D LIKE TO SPEAK, THERE WILL ALSO BE A CHANCE AT THE END TO HEAR ANYBODY WHO HASN'T ALREADY SPOKEN WHO WOULD WISH TO. IF YOU DON'T FEEL LIKE MAKING A VERBAL STATEMENT TONIGHT, YOU HAVE UNTIL THE 3RD OF AUGUST TO SUBMIT COMMENTS IN WRITING. AND, ALSO, IF YOU MADE A STATEMENT TONIGHT, YOU CAN SUBMIT COMMENTS IN WRITING. WRITTEN COMMENTS MUST BE DELIVERED OR POSTMARKED BY AUGUST 3RD AND SHOULD BE ADDRESSED TO MR. RAY JOHNSON, COUNTY OF SAN BERNARDINO PLANNING DEPARTMENT AT 385 NORTH ARROWHEAD, THIRD FLOOR, SAN BERNARDINO, CALIFORNIA 92415. AND I'LL HAVE THIS ADDRESS UP HERE AT THE END IF ANYBODY DIDN'T GET IT.

WHETHER YOUR STATEMENT IS GIVEN VERBALLY TONIGHT OR AT THE MEETING TOMORROW NIGHT IN SAN BERNARDINO OR WHETHER IN WRITING, ALL COMMENTS RECEIVE EQUAL WEIGHT. AND WE WILL RESPOND TO ALL

COMMENTS AS PART OF THE FINAL ENVIRONMENTAL IMPACT REPORT AND ENVIRONMENTAL IMPACT STATEMENT.

I'M GOING TO GO AHEAD AND START WITH COMMENTS. THE WAY THIS IS FORMATTED, YOU CAN COME UP AND MAKE WHATEVER COMMENTS YOU HAVE AS TO THE ADEQUACY OF THE REPORT. THIS IS NOT A QUESTION-AND-ANSWER SESSION; HOWEVER, THOSE OF US THAT CAME HERE FROM THE BUREAU -- AND I KNOW GEORGE WILL PROBABLY BE AROUND AFTER THE MEETING IF YOU HAVE ADDITIONAL QUESTIONS.

KEN, CAN YOU GO AHEAD AND COLLECT THE REGISTRATION NOTICES, IF ANYBODY WOULD LIKE TO TURN A NOTICE IN OR SPEAK.

PLEASE START WHEN YOU COME UP HERE BY GIVING YOUR NAME, YOUR ADDRESS AND THE GROUP YOU ARE REPRESENTING, IF YOU ARE REPRESENTING A GROUP.

OKAY. MS. HILDA MAE VOGHT.

MS. VOGHT: HILDA MAE.

MS. SEEHAFER: SORRY.

MS. VOGHT: THAT'S ALL RIGHT. AND THIS IS LIKE GOING TO THE POLLS TO VOTE. AND I HAVEN'T MUCH TO SAY TONIGHT AT ALL. BUT I WILL HAND IN THAT I DID WANT YOU TO KNOW I HAVE BEEN STUDYING THIS QUITE A BIT, AND WE DO SUPPORT THE PROJECT. AND I SPEAK FOR MYSELF AS A RESIDENT HERE FOR MANY,

MANY YEARS, AND ALSO I'M PRESIDENT OF THE MOJAVE DESERT CHAPTER OF THE PEOPLE FOR THE WEST, WHICH IS QUITE A GOOD-SIZED ORGANIZATION. WE WILL ALSO BRING THIS UP BEFORE OUR PROPERTY OWNERS ASSOCIATION AT OUR NEXT MEETING, WHICH WILL BE A WEEK FROM SATURDAY. AND WE WILL TURN OUR WHOLE PROBLEM IN AT THAT PROJECT.

WE ARE VERY, VERY MUCH AGAINST THEM HAVING TO BUY PRIVATE PROPERTY FOR THE --

THE REPORTER: I'M SORRY. MA'AM, CAN I HAVE YOU STAND OVER HERE MAYBE?

MS. VOGHT: I'M NOT GOING TO SAY MUCH.

WE ARE VERY, VERY MUCH OPPOSED TO ANYONE HAVING TO BUY PRIVATE PROPERTY AND TURNING IT IN TO THE FEDERAL GOVERNMENT UNDER ANY AGENCY BECAUSE IT TAKES IT OFF OUR TAX ROLES. AND WE HAVE TOO MUCH FEDERAL LANDS NOW. SO I WILL BE PUTTING THIS WHOLE THING TOGETHER AND MAIL IT IN.

THANK YOU.

MS. SEEHAFER: THANK YOU, HILDA MAE.

ALL RIGHT. THAT IS THE LAST PERSON TO HAVE TURNED IN A REGISTRATION CARD WHO WISHED TO SPEAK. DOES ANYBODY ELSE WISH TO MAKE A STATEMENT?

OKAY. IF THERE ARE NO FURTHER

STATEMENTS, I'D LIKE TO THANK YOU ALL FOR COMING TONIGHT. AS STATED EARLIER, ALL COMMENTS THAT WE RECEIVE TONIGHT AND TOMORROW NIGHT AND ALL WRITTEN COMMENTS WILL BE ADDRESSED IN THE FINAL ENVIRONMENTAL IMPACT STATEMENT, ENVIRONMENTAL IMPACT REPORT. IF THERE ARE ANY QUESTIONS WE CAN ANSWER FOR YOU AFTERWARDS, WE WILL BE HERE FOR THE NEXT HALF HOUR.

THANK YOU. TONIGHT'S MEETING IS ADJOURNED.

(THE HEARING WAS ADJOURNED AT 7:30 P.M.)

REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) SS.
COUNTY OF RIVERSIDE)

I, SANDRA L. HOPPER, A CERTIFIED SHORTHAND REPORTER, DO HEREBY CERTIFY THAT THE FOREGOING 15 PAGES COMPRISE A FULL, TRUE, AND CORRECT TRANSCRIPTION OF THE PROCEEDINGS HAD AND THE TESTIMONY TAKEN AT THE HEARING IN THE HEREINBEFORE-ENTITLED MATTER.

DATED THIS 1ST DAY OF JULY, 1993, AT RIVERSIDE, CALIFORNIA.

Sandra L Hopper
SANDRA L. HOPPER, C.S.R.
C.S.R. NO. 7110

IN RE: FORT CADY MINERALS POST BORATE MINE

REPORTER'S TRANSCRIPT OF PROCEEDINGS

LOCATION:
SAN BERNARDINO PLANNING OFFICE
385 N. ARROWHEAD AVENUE
JOSHUA ROOM
SAN BERNARDINO, CA 92415

DATE AND TIME:
WEDNESDAY, JUNE 30, 1993
7:16 P.M. - 7:24 P.M.

REPORTED BY:

SANDRA L. HOPPER, C.S.R.

(NO. 7110)

JOB NO. 22990SH

APPEARANCES

SPEAKERS:

EDY SEEHAFER
GEORGE HARTMAN
RAY JOHNSON

SAN BERNARDINO, CA WEDNESDAY, JUNE 30, 1993

PROCEEDINGS

MS. SEEHAFER: ALL RIGHT. OKAY. GOOD EVENING AND WELCOME. THIS IS THE SECOND OF TWO PUBLIC MEETINGS THAT WILL BE HELD ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT SLASH ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED FORT CADY BORATE SOLUTION MINING PROJECT.

MY NAME IS EDY SEEHAFER. I'M THE ENVIRONMENTAL COORDINATOR FOR THE BARSTOW RESOURCE AREA BUREAU OF LAND MANAGEMENT, AND I'LL OBE FACILITATING THIS MEETING.

THE PURPOSE OF TONIGHT'S MEETING IS TO RECEIVE COMMENTS ON THE ADEQUACY OF THE DRAFT E.I.S./E.I.R., WHICH THE BUREAU OF LAND MANAGEMENT AND THE COUNTY OF SAN BERNARDINO HAVE PREPARED IN CONNECTION WITH FORT CADY'S BORATE MINING PROJECT. SOME EXTRA COPIES OF THE ENVIRONMENTAL IMPACT STATEMENT ARE BACK ON THE DESK IF YOU'D LIKE TO TAKE ONE.

THE JOINT DRAFT E.I.S./E.I.R. HAS BEEN PREPARED UNDER THE REQUIREMENTS OF BOTH THE NATIONAL ENVIRONMENTAL POLICY ACT AND THE CALIFORNIA ENVIRONMENTAL QUALITY ACT. THE PURPOSE

OF THE DOCUMENT IS TO ANALYZE THE PROBABLE ENVIRONMENTAL IMPACT OF THE PROPOSAL. AND THE PROPOSAL AREA INCLUDES BOTH PUBLIC AND PRIVATE LANDS. THE COUNTY AND THE FEDERAL JURISDICTIONS ARE SEPARATE AND DISTINCT, AND WE ACT IN OUR OWN CAPACITIES.

BASICALLY, THE BUREAU OF LAND MANAGEMENT'S ROLE HAS BEEN TO OVERSEE THE RIGHT-OF-WAY PROPOSALS AND TO REVIEW THE MINING PLAN OF OPERATION AND RECLAMATION PLAN, AND TO OVERSEE THE SURFACE REQUIREMENTS ON THE PUBLIC LANDS. THE B.L.M. MAY DETERMINE APPROPRIATE MODIFICATIONS AND/OR CONDITIONS IN CONJUNCTION WITH THE PLAN OF OPERATIONS AND RECLAMATION PLAN TO PROTECT OTHER SURFACE RESOURCE VALUES.

RAY, WOULD YOU LIKE TO SAY SOMETHING ABOUT THE COUNTY'S ROLE IN THIS DRAFT E.I.S./E.I.R.?

MR. JOHNSON: BASICALLY, THE COUNTY'S ROLE IS THAT OF EVALUATING THE ENVIRONMENTAL IMPACT TO THOSE PORTIONS OF THE PROJECT WHICH ARE PATENTED CLAIMS AND, THEREFORE, WITHIN THE JURISDICTION OF THE COUNTY.

I GUESS MY PRIMARY COMMENT WOULD BE THAT WE HAVE DISCUSSED THIS AT GREAT LENGTH IN THE

SCREEN-CHECK STAGE. AND I THINK AS A RESULT OF HAVING DISCUSSED ALL OF THE ISSUES PRETTY ADEQUATELY AT THAT POINT AND HAVING SENT COPIES TO VIRTUALLY EVERYBODY IN THE WORLD, I THINK THAT HAS REALLY REDUCED THE AMOUNT OF PUBLIC THAT WE'RE SEEING, UNFORTUNATELY.

MS. SEEHAFER: OKAY. THANK YOU, MR. JOHNSON.

OKAY. WHAT I'D LIKE TO DO IS TO HAVE GEORGE HARTMAN OF FORT CADY MINERALS CORPORATION COME UP AND BRIEFLY EXPLAIN THE PROJECT, AND THEN WE WILL OPEN THE MEETING UP FOR ANY PUBLIC STATEMENTS THAT ANYBODY WOULD WISH TO MAKE. AND IF YOU DO NOT WISH TO MAKE A PUBLIC STATEMENT TONIGHT, YOU HAVE THE OPPORTUNITY TO MAKE WRITTEN COMMENTS. THESE COMMENTS MUST BE SUBMITTED NO LATER THAN AUGUST 3RD, 1993.

OKAY. GO AHEAD, GEORGE.

MR. HARTMAN: THANK YOU, EDY.

FIRST OF ALL, I'D LIKE TO THANK EVERYONE FOR COMING TO THIS MEETING. I'D LIKE TO INTRODUCE LES SINGER HERE OF DAMES & MOORE. HE WAS THE THIRD PARTY COMPANY THAT PUT TOGETHER THE E.I.S./E.I.R.

WE HAVE AN OVERLAY HERE OF THE PROJECT THAT'S FIGURE 1.2-2 OF THE E.I.R./E.I.S. AS YOU

CAN SEE, I-40 GOES ALONG HERE. WE COME ALONG NATIONAL TRAILS HIGHWAY TO PISGAH ROAD. COME DOWN TO PISGAH ROAD, THEN GO CROSS-COUNTRY TO OUR PROCESSING STATION. AND THE ORE BODY IS LOCATED TO THE SOUTH OF THAT. WE HAVE A GYPSUM HOLDING POND TO THE WEST OF THAT. WE ALSO HAVE A RAILROAD COMING IN TO THE PROCESSING AREA. WE HAVE FRESH-WATER GATHERING AREAS IN -- TO THE SOUTH OF THE PISGAH CRATER HERE -- I MEAN, PISGAH FAULT. AGAIN, THIS FIGURE IS IN YOUR E.I.S./E.I.R.

BASICALLY THE PROJECT ENTAILS TWO THINGS: MINING AND PROCESSING. THE MINING WILL BE DONE BY INSERTING WELLS INTO THE ORE BODY. THESE WELLS ARE VERY SIMILAR TO FRESH-WATER WELLS THAT YOU OBTAIN YOUR WATER FROM. THE ONLY DIFFERENCE IS IT'S ABOUT 1400 FEET DEEP, AND IT'S FIBERGLASS CASING OR PLASTIC CASING. THIS IS A CROSS-SECTION OF THE ORE BODY LOOKING SIDEWAYS TO IT. THE BOTTOM FIGURE, AGAIN, IS IN YOUR E.I.S./E.I.R. THIS IS A CROSS-SECTION LOOKING DOWN THE ORE BODY.

THE NEXT ITEM IN THE PROJECT IS THE -- IS THE PROCESSING. THIS FIGURE'S IN YOUR E.I.S./E.I.R. 2- -- I'M SORRY, 2.2-2. WE COME OUT OF THE WELL FIELD WITH OUR SOLUTION. WE COOL IT. WE FILTER IT. SOME OF THE MATERIAL THAT HAS

FILTERED OUT WILL BE ENTERED BACK INTO THE PROCESS STREAM. WE GO INTO A SOLVENT-EXTRACTION UNIT. AND THE SOLVENT EXTRACTION IS USED IN MANY MINERALS TODAY: COPPER, URANIUM, NICKEL. IT'S USED EXTENSIVELY THROUGHOUT THE MINERAL PROCESS.

FROM THERE THE SOLUTION COMES INTO THE REGENERATION AREA WHERE WE ADD SULFURIC ACID TO IT. THE SULFURIC ACID COMBINES WITH THE CALCIUM THAT WE OBTAIN FROM THE ORE BODY. FROM THERE WE MAKE GYPSUM. WE FILTER THE GYPSUM OUT, AND WE PLACE IT IN OUR GYPSUM HOLDING AREA. WE INTEND TO SELL THAT TO THE CONCRETE PRODUCERS AND/OR THE WALLBOARD PRODUCERS.

FROM THERE THE SOLUTION IS REINJECTED INTO THE WELL FIELD, AND THE SAME SOLUTION IS RECYCLED, RECYCLED, RECYCLED.

THE BORIC ACID ITSELF IS STRIPPED FROM THE SOLVENT EXTRACTION CIRCUIT. COMES INTO A CRYSTALLIZER WHICH MAKES POWDERED BORIC ACID. FROM THERE WE GO TO A SOLID LIQUID SEPARATION UNIT, WHICH IS A CENTRIFUGE. FROM THERE WE GO INTO THE DRYING UNIT. FROM THERE WE EITHER GO INTO BULK PRODUCT OR TO BAGGING FACILITIES. AND THAT PROVIDES OUR PRODUCT.

THAT PRETTY WELL SUMMARIZES MY

PRESENTATION. AND I'LL RETURN CONTROL TO EDY.

MS. SEEHAFER: THANK YOU, MR. HARTMAN.

IS THERE ANYONE WHO WOULD LIKE TO MAKE A STATEMENT TONIGHT?

HEARING THAT NOBODY WOULD WISH TO MAKE A STATEMENT, WE WILL GO AHEAD AND CLOSE THE PROCEEDINGS TONIGHT. AND WE WILL BE AROUND AFTERWARDS IF SOMEONE WOULD LIKE TO COME UP AND TALK TO EITHER MYSELF OR MR. HARTMAN OR MR. JOHNSON. THIS MEETING IS ADJOURNED. THANK YOU ALL.

(THE HEARING WAS ADJOURNED AT 7:24 P.M.)

REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) SS.
COUNTY OF RIVERSIDE)

I, SANDRA L. HOPPER, A CERTIFIED SHORTHAND REPORTER, DO HEREBY CERTIFY THAT THE FOREGOING 8 PAGES COMPRISE A FULL, TRUE, AND CORRECT TRANSCRIPTION OF THE PROCEEDINGS HAD AND THE TESTIMONY TAKEN AT THE HEARING IN THE HEREINBEFORE-ENTITLED MATTER.

DATED THIS 1ST DAY OF JULY, 1993, AT RIVERSIDE, CALIFORNIA.

Sandra L Hopper

SANDRA L. HOPPER, C.S.R.
C.S.R. NO. 7110

RESPONSES TO COMMENTS

Governor's Office of Planning and Research

1. Comment acknowledged.

State of California, Department of Transportation, District 8

1. A Hazardous Materials Handling Permit (#9202240012) and Business Plan have been obtained for the proposed action. Shipment of hazardous materials will be in compliance with Department of Transportation regulations (see page 2-29 of the Draft EIS/EIR).

State Lands Commission

1. This is a very directed and controlled mining method, in contrast to oil wells which drain a reservoir regardless of its jurisdictional geographic extent. The reason project plans include a buffer zone of at least 300 feet to be maintained between mining wells and the project boundary is to restrict mineral extraction to areas within project ownership. Acid solution is injected into a well and allowed to remain in the formation for a period of 4 to 12 hours to facilitate its reaction with the ore body. Once the chemical reaction is thought to reach equilibrium, the boron-rich solution is pumped from the well. Because this mining method involves chemical reactions that reach equilibrium, the portion of the ore body being mined is very localized (i.e., limited in extent). This is the reason why as many wells (about 200) would be needed over the life of the project. State minerals would not be drained accidentally using this method.

Kenneth M. Reim

1. The project would have beneficial impacts to the local economy through provision of employment opportunities and local spending for materials and supplies. This positive local impact, although small on a regional scale, is acknowledged in the Draft EIS/EIR.

San Bernardino County Museum

1. The paleontologic resources management plan will be followed by Fort Cady Minerals Corporation. Adherence will be jointly enforced by BLM and the County of San Bernardino.

Steve Baele

1. Fort Cady Minerals Corporation has contacted prospective buyers for the gypsum and believes, based on these contacts, that the gypsum is marketable. Marketing commitments have been received from one chemical supply company. Discussions have also been conducted with at least two other companies interested in purchasing the

gypsum. These companies have performed chemical analyses on Fort Cady Minerals Corporation gypsum produced during onsite pilot testing and have confirmed the gypsum to be high quality material of which they are interested in buying. If the gypsum cannot be sold, it would be transported to a gypsum mine, and if this is not feasible, it would be given to a manufacturer of wall board. The gypsum deposition area is sufficiently large to store the product during possible periods of unfavorable marketing conditions. Chemical analyses (Tables 2.2-3 and 2.2-4 in the Draft EIS/EIR) of gypsum produced during pilot mining indicated that it would constitute a non-hazardous product.

2. A detailed analysis of the potential for groundwater contamination, including use of the USGS-developed model PHREEQE, was conducted and reported in the Draft EIS/EIR. The analysis concluded that the potential to contaminate aquifers east and west of the ore body is remote because: (1) abundant minerals (particularly colemanite and calcite) exist within the ore body to neutralize injected acidic mining solution; (2) the mudstone formation enclosing the ore body is relatively impermeable and predominantly unfractured; and (3) the Pisgah Fault and Fault B act as barriers to large-scale infiltration of ore body formation waters to the aquifers to the east and west. Regulatory agency decisions to approve or not approve the project will be based on information in the EIS/EIR and specific permit applications.

3. The estimated 130 years of production was calculated as follows using the data presented on page 2-25 of the Draft EIS/EIR:

$$\frac{(9{,}392{,}000 \ \textit{tons ore reserve}) \times (0.7 \ \textit{ore recovery})}{50{,}670 \ \textit{tons recovery per year}} = 129.75 \ \textit{years}$$

4. As indicated on page 3-16 of the Draft EIS/EIR, the potential for surface fault rupture exists within the project area along the traces of the Pisgah Fault and Fault B but is considered to be low. Should such an event occur, a pipeline could rupture and release fluids. Well pumping would be halted until the area affected by the release was cleaned up and the pipeline repaired.

   Pipelines would be routinely monitored during normal operations. A pipeline rupture would be immediately recognized in the process plant control room, since a sharp change in pressure and the rate of flow within the pipeline would result. Alarm systems would be activated (either by computer or by process plant staff), and pump operation would be halted until the pipeline was repaired. As an added precaution, operator patrols would visually monitor the process equipment regularly.

5. The solvent extraction process is a common and popular method of concentrating and purifying mineral ions. There are no waste streams in this circuit. The solvent is continuously circulated in a closed loop between the loading and stripping reactions, hence no continuous bleeding operation is required. If the solvent becomes too concentrated with impurities, it is scrubbed using well field injection solution and then

centrifuged. The resulting impurities are recycled to the well field for subsequent leaching. The resulting cleaned solvent is then routed back to the extraction circuit.

6. The decision to acquire the proposed site was based on size of deposit, availability for purchase, and cost. Grade and thickness of ore deposit were not considerations because size of deposit was an overwhelmingly dominant factor. As shown in the ore deposit listings in Section 2.6.3.1 of the Draft EIS/EIR, the size of the ore body at the proposed location was almost twice as large as the next largest deposit at Rho A and B (147.4 versus 82.0 million short tons). The proposed location was also the lowest cost.

7. Cumulative impacts were addressed in Section 9.0 of the Draft EIS/EIR. Potentially significant impacts were identified as consumption of groundwater resources and land use conflicts with the proposed Pisgah Crater ACEC designation. The Rheox, Inc. mining operation, including its approved expansion, was taken into account in the cumulative impact analysis as documented in Section 9.1 of the Draft EIS/EIR.

8. The statement should more properly have read: Night lighting would attract insects and result in an increased concentration of nighttime insect prey in the area.

9. The last paragraph on page 4-32 should more properly have read:

   Degradation of habitat (including desert tortoise habitat) would occur due to soil disturbance, increased levels of noise, traffic, equipment movement, possible fluid leakage, dust, and human presence. The low level of activity anticipated for this type of mining operation would result in minimal effects for these operational impacts and they would be primarily confined to the site.

Department of Conservation, Division of Mines and Geology

1. The Mining and Land Reclamation Plan (Plan) was prepared to describe the components of the Mine Plan and the procedures to be implemented to reclaim the disturbed areas associated with the proposed Fort Cady Minerals Corporation Solution Mining Project. This plan was prepared in accordance with Federal, State, and County requirements. The plan was compiled using the U.S. Department of the Interior Bureau of Land Management (BLM) Manual Handbook H-3042-1 "Solid Minerals Reclamation Handbook" (April 8, 1992), the California Department of Conservation, Division of Mines and Geology "Surface Mining and Reclamation Act of 1975 Public Resources Code 2710-2795," "Article 9, Reclamation Standards 3700-3713" (January 15, 1993), the "Reclamation Bond Calculation/Evaluation Guide (September 1989), and the Financial Assurance Guidelines" (August 13, 1992), and the San Bernardino County "Mining and Land Reclamation Plan Application Forms and Information" (July 1, 1991).

2. The U.S. Fish and Wildlife Service Biological Opinion indicated that the maximum speed should be 20 miles per hour. However, air quality mitigation for dust emissions was a maximum speed limit of 15 miles per hour. The more stringent limitation (15 miles per hour) would be applied to the proposed project.

County of Orange

1. Comment acknowledged.

U.S. Department of Transportation

1. Comment acknowledged.

U.S. Environmental Protection Agency

1. The Underground Injection Control (UIC) Program is intended to protect underground sources of drinking water (USDW). A USDW is defined (40 CFR 144.3) as an aquifer that actually or potentially supplies a public water system, currently supplies water for human consumption, and contains fewer than 10,000 mg/L total dissolved solids (TDS). The proposed project would involve use of injection wells to extract minerals in solution from an ore body that: (1) is enclosed within a mudstone formation that is relatively impermeable and predominantly unfractured; (2) is within a mudstone formation that is bounded on the east and west by faults that act as barriers to large-scale infiltration of ore body formation water to aquifers to the east and west; and (3) contains formation water with TDS concentration in excess of 20,000 mg/L. The formation water in the ore body does not currently, nor does it potentially, represent a water supply for human consumption. Furthermore, as documented in the EIS/EIR the potential for contamination of aquifers to the east and west as a result of acidic mining solution injection was evaluated as remote. Groundwater monitoring would be conducted to ensure that no contamination occurs. Based on these considerations, the UIC Program is not applicable to the proposed project.

2. The Draft EIS/EIR does not state that water with a TDS concentration of 1,000 mg/L is unusable for drinking water. The statement is made that 1,000 mg/L TDS concentration is the recommended drinking water standard that should not be exceeded (standard used by U.S. EPA and Cal-EPA). In taking action on the pilot project, the May 12, 1988 Regional Water Quality Control Board Order No. 6-88-63 (WDID 6B368020008) stated in Item 25 (page 4) that "the groundwater located at the project site is inferior for domestic purposes with TDS and fluoride concentrations exceeding recommended drinking water standards."

3. With reserves sufficient for 130 years, mining expansion into the area west of Pisgah Fault would not occur with this project. Therefore, no injection wells are proposed or planned in that area.

4. UIC Program requirements are not considered applicable to the proposed project.

5. As discussed on pages 3-29 through 3-31 of the Draft EIS/EIR, safe yield is estimated to range from 163 to 405 acre-feet. Proposed project requirements are 161 acre-feet. The proposed project by itself would not exceed the lower end of this estimated range for safe yield. However, in combination with the water demand for the adjacent Rheox, Inc. mining project (15 acre-feet), water use would total 176 acre-feet. This would exceed the lower safe yield estimate and represent a potentially significant impact. Parameters for the cone of depression to assess drawdown impacts were hydraulic conductivity and pumping rate. The maximum radius of influence occurs when hydraulic conductivity is at a minimum; therefore, the minimum hydraulic conductivity value of 1.6 feet/day was used. Two pumping rate scenarios were used: (1) five wells pumping at 20 gpm each; and, (2) one well pumping at an average of 100 gpm. These rates represent reasonable forecasts of maximum pumping for the project. It is estimated that recharge/recovery would occur within less than one year after project water well pumping ceased. There are no springs, seeps, or phreatophytic vegetation in the project area. Therefore, there would be no drawdown impacts on such resources.

6. The Draft EIS/EIR identifies use of recycled water as mitigation to reduce groundwater demand. The impact on groundwater may still be significant with this mitigation.

7. The proposed project would not affect any waters of the U.S., springs, or seeps. There are no perennial streams in the project area to be impacted. The discussions on pages 4-9, 4-17, and 4-19 of the Draft EIS/EIR for surface water drainage impacts and mitigation refer to the location of the gypsum deposition area prior to its being moved in response to the U.S. Fish and Wildlife Service Biological Opinion. The old location would have required proper engineering design to mitigate potential flooding and erosion considerations. The new location does not have substantive flooding or erosion concerns. Surface drainage modifications associated with other project facility locations, including alternatives, are negligible. It should also be noted that there are no substantial facilities or populations in the project area and vicinity that would be at risk should a flooding event occur along natural drainages.

8. Based on site visits by BLM, U.S. Fish and Wildlife Service, and Dames & Moore personnel, no Section 404 permit is expected to be required.

9. See responses to comment number 7 above.

10. Potential impacts and mitigation measures relative to the Research Natural Area and proposed Area of Critical Environmental Concern (ACEC) are discussed in Sections 4.1.5 (Biological Resources) and 4.1.6 (Land Use/Recreation) of the Draft EIS/EIR. The proposed ACEC designation is currently being evaluated. If the designation is approved, BLM will prepare a Management Plan for the area. This Plan would identify potential

conflicts with existing or proposed uses in the area and specify mitigation that would be required to resolve conflicts. All activities would be consistent with this Management Plan.

11. The Cady Mountains Wilderness Study Area (WSA) is approximately 5 miles north and east of the project area. The proposed project is not expected to have a potentially significant impact on this WSA because: (1) the separation distance is large; (2) views from the WSA toward the project already include manmade changes in the landscape (power lines, I-40, railroad, Rheox mine); and (3) measures are included to mitigate the visual impacts of the process plant (whether at the proposed or alternative locations) to a non-significant level.

Newberry Springs Harvard Property Owners Association

1. Comments acknowledged.

California Department of Fish and Game

1. A Spring Floral Survey was conducted in 1990, and all species observed were identified or keyed to at least genus. No Mohave monkeyflower (*Mimulus mohavensis*) were found on the project area (J. Wear, Lilburn Corporation, personal communication). This is consistent with the extensive surveys conducted on the nearby N.L. Hector property which has sandier soils and a higher potential to represent monkeyflower habitat, but neither *Mimulus mohavensis* nor *Mimulus bigelovii* were observed in that area.

2. As the Draft EIS/EIR states, the crucifixion thorn and Utah cynanchum both occur in the area, but not in areas planned for disturbance (page 4-29). The statement on page 4-35 that sensitive plants would be transplanted was intended to address the situation if an isolated plant was found in the project area in the future. An individual specimen of crucifixion thorn was observed in the original gypsum deposition area but will not be affected as that deposition area was subsequently relocated. Therefore, no discernible impacts to that individual plant or to this species are anticipated.

   Maps showing the location of rare plant populations were not included in the Draft EIS/EIR because disclosure of this information in public documents may result in disturbance of sensitive plant areas. However, such maps are on file and available from BLM.

3. Avoidance and preservation of existing crucifixion thorn is feasible; therefore, no discernible impacts to sensitive plant species are anticipated.

4. The 1,480 acre amount in Table ES-5 (page ES-11) is an error and should be 341 acres. The 341 acres was calculated using the most current BLM habitat compensation formula and was listed in the amended Biological Opinion (Appendix C in the Draft EIS/EIR).

BLM's policies on the disposition of compensation lands are outside the scope of this document.

5. Comment acknowledged. Additional measures identified in the document have been added to the summary of mitigation measures.

6. The 2081 Management Agreement should be added to the list of required State of California Permits. The terms and stipulations of the permit would be determined during the permit application process.

Mojave Water Agency

1. The project as currently proposed may or may not cause overproduction of the local groundwater supply (see response to U.S. Environmental Protection Agency comment number 5). The maximum radius of influence for drawdown is 2½ miles; Newberry Springs is about 17 miles west of the project area. Therefore, the proposed project would not impact wells in the Newberry Springs area. This project has already significantly mitigated for potential groundwater impacts. The project originally proposed the use of evaporation ponds rather than the solvent extraction process. The use of evaporation ponds would have required much larger volumes of water — 9 times more water than is required for the solvent extraction process. As discussed on page 4-20 of the Draft EIS/EIR, recycling of water offers the only additional mitigation for water consumption impacts. Even with this mitigation, the impact may remain potentially significant depending on the actual safe yield of the aquifer and the effectiveness of recycling efforts.

2. Comment acknowledged and the water well plan has been amended to exclude the well with Mojave Water Agency jurisdiction. The original project plan called for the installation of up to 7 wells to accommodate the water demand associated with the evaporative ponds and other operations associated with the project. As a result of changing to the solvent extraction process, fewer wells (no more than five) would be needed. Figure 1.2-2C in the Draft EIS/EIR showed the original plan for up to seven wells. The lesser water needs of the solvent extraction process make the wells in Section 24 and Section 19 unnecessary, and they are no longer part of the proposal. The map has been amended and no wells for the current proposal would be within the Mojave Water Agency jurisdictional boundaries.

3. See response to comment number 1.

4. Drainage pattern alterations are expected to be negligible (see response to U.S. Environmental Protection Agency comment number 7). There are no perennial streams or major washes in the project area. Therefore, it is not expected that sedimentation and degradation of stream channels would occur to an extent such that there would be substantial groundwater recharge decreases or downstream flooding increases.

5. The potential for mining solution contamination of water supply aquifers is remote (see response to Steve Baele comment number 2). However, a groundwater monitoring program will be developed in accordance with Regional Water Quality Control Board (Lahontan District) requirements as part of the Waste Discharge Report permit process.

6. As stated in the Draft EIS/EIR (Section 3.1.3.8), subsidence due to tectonic downwarping, fluid withdrawal, or mining is not occurring in the project area or vicinity at this time. The proposed project is not expected to cause significant subsidence impacts as a result of solution mining and/or water well pumping (see Section 4.1.1.2 of the Draft EIS/EIR). Subsidence due to tectonic downwarping would be a natural event, if it occurred, not a project-induced phenomenon. No additional investigation of subsidence is needed.

Sierra Club Angeles Chapter Desert Committee

1. See response to Mojave Water Agency comment number 1.

2. Recharge/recovery is expected to occur within less than 1 year after water well pumping ceases. Therefore, short-term use of groundwater is not expected to have significant impacts on long-term productivity. If the ACEC designation is approved, BLM will prepare a Management Plan which will include mitigation measures to resolve possible conflicts with other uses in the area. Other potentially significant impacts were mitigated to a level of non-significance, as discussed in Section 4.0 of the Draft EIS/EIR.

3. The potential for contamination of an aquifer as a result of an accident at the process plant is unlikely. Tanks holding the various process solutions would be contained within bermed areas equipped with sump pumps. This would minimize the potential for fluids to escape to the surrounding environment.

   If, despite precautions, an accidental release does occur, the operation of the affected facility would be halted and appropriate regulatory authorities notified. The area would be cleaned up using appropriate procedures based on the type of material spilled, and the defective equipment would be repaired or replaced. A report of the incident would also be prepared and reviewed by site maintenance personnel and management as part of an ongoing accident prevention program.

4. As discussed in the Draft EIS/EIR, contacts were made with both the County of San Bernardino and Edwards Air Force Base regarding building height. In both cases, the proposed building height was stated not to be a problem and could be handled with a variance because of the tall transmission lines adjacent to the plant site. A variance is not mitigation.

5. See response to U.S. Environmental Protection Agency comment number 10.

6. See response to U.S. Environmental Protection Agency comment number 10. No recreation conflicts would occur.

7. The information was included as part of the analysis for the No Action Alternative and is a qualitative assessment of potential economic benefits that might not occur; no quantitative information was developed.

Regional Water Quality Control Board, Lahontan Region

1. Comment acknowledged. Waste Discharge Report requirements will be met.

2. UIC Program requirements are not considered applicable to the proposed project (see response to U.S. Environmental Protection Agency comment number 1).

3. As analyzed in Section 4.1.2.2 of the Draft EIS/EIR, injection operations are not expected to have a significant impact on beneficial uses or water quality objectives for groundwater aquifers due to geologic containment and neutralization of acidic mining fluids. Based on discussions with RWQCB staff, an amendment to the Basin Plan may be required. If required, RWQCB staff would conduct additional focused environmental review.

4. Preliminary concepts for a groundwater monitoring program were discussed in Section 4.1.2.4 of the Draft EIS/EIR. More detailed information will be developed in consultation with RWQCB as part of the review and approval process for the WDR permit.

5. Project groundwater consumption (161 acre-feet), in conjunction with Rheox, Inc. use (15 acre-feet), would exceed the lower end of safe yield estimates (163 to 401 acre-feet) by about 13 acre-feet. This change is not expected to be sufficiently large to result in substantial increases in TDS concentrations or otherwise significantly degrade water quality. Given the wide range of safe yield estimates, there may be no overdraft at all.

6. Closure and post closure of project facilities, both surface and subsurface, were discussed in Section 2.2.4 of the Draft EIS/EIR. Closure of the site after mining is complete includes ensuring the mining zone water is neutralized. As discussed in Section 3.2 of the Draft EIS/EIR, residual affected fluids remaining in the formation would be naturally neutralized by the large tonnages of evaporite and clay minerals present in the formation. The result would be that the pH of the solution would be elevated to a pH of approximately 7 or higher. To ensure that no low pH material remains undetected in the ore zone some 1,400 feet below the surface in the formation, water would be pumped to the surface and tested for pH. If free acid is present, lime (CaO) would be added to the water to neutralize the free acid. After chemical neutralization is complete, the water would be returned to the formation. Additional information regarding neutralization of the affected formation water was presented in Section 4.1.2.4.

Mojave Desert Air Quality Management District

1. Comment acknowledged.

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